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Vol. 13. No. 12. pp. 415-450. December, 1943

IMPERIAL MYCOLOGICAL INSTITUTE
7 DEC 1943

THE VETERINARY BULLETIN

1943

IMPERIAL BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Price 5/- net Annual Subscription £2

Imperial Agricultural Bureaux.

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REVIEW ARTICLES

(1) " **Antibacterial Agents derived from Micro-Organisms** ".

(2) " **The Present Position of Phenothiazine as an Anthelmintic** ".

Reprints (price 1/– and 1/6 respectively) obtainable from: Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.

The Editor will be glad to receive publications relating to Veterinary Science and cognate subjects in order that they may be dealt with in the *Veterinary Bulletin*.

Reports of Departments, Special Reports, reprints, etc., etc., should be sent as soon as they are issued.

Books for Review.

The Editor will be glad to receive books for review in the *Veterinary Bulletin*.

Bulletins on disease subjects written for farmers and " popular " articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature, are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin*.

NOTE:—In certain cases it is not possible to check references in the original publication. Such references are marked with an asterisk.

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 13.] December, 1943. [No. 12.

DISEASES CAUSED BY BACTERIA AND FUNGI

SHERMAN, J. M., NIVEN, C. F., Jr., & SMILEY, K. L. (1943). **Streptococcus salivarius and other Non-Hemolytic Streptococci of the Human Throat.**—*J. Bact.* **45.** 249–263. **2793**

From the throats of normal persons, 331 cultures of non-haemolytic streptococci were isolated; 184 were *Str. salivarius* and 147 *Str. mitis*. On the whole, *Str. salivarius* forms a homogeneous group: a simple test for its identification is the ability to produce large mucoid colonies in 5% sucrose agar, although care must be taken to avoid confusion with hetero-fermentative β-cocci and strains of *Str. bovis* which will synthesize polysaccharides from sucrose. Other differential characters are also given.

Efforts to produce group-specific sera for *Str. salivarius* were unsuccessful, but type-specific sera were prepared which permitted a partial survey of the serological groupings. About 40% belonged to one serological type, termed "type I", which gave no cross-reactions with representative cultures of other known haemolytic streptococci: occasionally cross-reactions were noted with strains of the *Str. mitis* group. The latter organism was less easily classified, forming a complex group and giving diverse results in many of the reactions studied.

Str. salivarius was successfully isolated from human faeces by a combination of 0·02% sodium azide, and 5% sucrose in a tryptone, yeast-extract agar. *Str. equi* was not isolated from the human throat or faeces.—R. E. GLOVER.

KUJUMGIEW, I., & NEFTIANOWA, E. (1940). Ueber die Dissoziationserscheinungen bei den Antimilzbrandvakzinen. **[Signs of Dissociation in Anthrax Vaccines].**—*Zbl. Bakt. I. (Orig.).* **146.** 265–273. **2794**

R, RS, and S variants were observed in two anthrax vaccines newly acquired from the Pasteur Institute. The R strains were fixed and the S strains gradually became R. The R variants yielded thin, sporulating, non-capsulated bacilli forming colonies without haemolytic properties, whilst S variants yielded thick capsulated bacilli and sticky colonies with haemolytic properties. The R type was Gram +, the S type Gram ±. The R type was more virulent and superior in immunizing power.

BALDWIN, E. R. (1942). **Nonpathogenic Acid-Fast Bacilli. I. A Case of Chronic Pneumonitis Associated with a Nonpathogenic Acid-fast Bacillus. II. The Presence of Acid-fast Soil Bacteria on Raw Fruits and Vegetables.**—*Amer. Rev. Tuberc.* **45.** 756–761. [Spanish summary]. **2795**

I. B. reports illness in a woman in which there was pneumonia followed by some physical changes in the chest. Sputum examinations and smears were negative on microscopic examination, but culture from repeatedly collected sputum samples on Petroff gentian-violet-egg plates yielded acid-fast bacilli which were nonpathogenic for g. pigs, rabbits, chickens, and white mice.

II. Chromogenic acid-fast bacilli resembling *Mycobacterium phlei* were isolated from various fruits and vegetables. Such bacilli might be found in specimens received for diagnosis and their importance in this respect is referred to.—ANTHONY BUXTON.

STÜMPKE. (1940). Ueber die Tuberculosis cutis verrucosa beim Menschen. Ihre Entstehung und Behandlung. **[Tuberculosis cutis verrucosa in Man: its Nature and Treatment].**—*Dtsch. tierärztl. Wschr.* **48.** 647–650. **2796**

S. found 43 cases of tuberculosis cutis verrucosa among 2,200 cases of lupus observed in lower Saxony. The condition is usually caused by the bovine type tubercle bacillus and is commonest in persons having contact with cattle. The 43 cases are discussed with special reference to treatment.—J. E.

*URABE, K. (1940). **[The Types of Tubercle Bacilli Isolated from Human Tuberculosis in Japan].**—*Hukuoka Acta Med.* **33.** 869. [In Japanese]. [English version p. 62]. [Abst. in *J. Dairy Sci.* **25.** A283, copied *verbatim*. Signed: R. E. L. B.] **2797**

Human tuberculosis of bovine origin is proportionately less common in Japan than in America and Europe. This may be due to the low percentage of tuberculous cattle in Japan and to the national custom of not drinking raw milk.

GNOSSPELIUS, A. (1939). Ueber eine Tuberkulose-Epidemie boviner Herkunft einer Stadtbevölkerung und einer Ferienkolonie für Kinder. **[An Epidemic of TB. of Bovine Origin Involving the Inhabitants of a City and of a Summer Camp for Children].**—*Acta paediatr., Stockh.* **26.** 194–205. [English summary]. **2798**

In the tracing of the source of infection in two children sent to hospital on account of suspected TB., it was found that a farmer in the hinterland of Gothenburg had been supplying 33 families with raw milk. There were 100 persons in these families who had consumed raw milk and on tuberculin testing 98 reacted and 23 showed clinical signs of infection by the bovine type tubercle bacillus. Milk was also supplied from the same farm to a holiday home for children and on investigation of 42 of the children, 16 were found to be tuberculin positive and 17 of the 42, not all of which were part of the group of reactors, showed clinical signs of TB.

The sole source of infection in all these cases was evidently a single cow which was sold before the above investigations were made and before the herd was examined and tuberculin tested. The herd was considered to show evidence of fresh infection since there were severe reactions to the tuberculin test. It is stated that none of the human cases of TB. were of a serious nature.

In 1939, legislation was enacted in Sweden whereby pasteurization was made compulsory for the milk supply of all large towns.—J. E.

WALLGREN, A. (1943). **The Prevention of Tuberculosis.**—*Yale J. Biol. Med.* **15.** 411–422. **2799**

An account of the excellent prophylactic measures taken against infant TB. in Gothenburg. The low incidence is noted of bovine type TB. in Swedish towns, where all milk is required to be pasteurized, and contrasted with the relatively high incidence in the country districts where raw milk is consumed.

KELLER, H. (1943). Magentuberkulose des Schweines. [**Gastric TB. in Pigs**].—*Z. Fleisch- u. Milchhyg.* **53.** 125–127. **2800**

Further observations on gastric TB. in swine, an extremely rare condition. Non-ulcerating lesions appear in the muscularis of the lesser curvature of the pyloric region, which are not primary; these arise by spread from the tuberculous gastric lymph nodes, which are themselves affected in association with the hepatic and coeliac lymph nodes. Cases recorded in the literature are briefly described.—E. COTCHIN.

POINDEXTER, H. A. (1943). **Multiple Bacteriological Aetiology in Clinical Tuberculosis. Experimental Observations.**—*Amer. Rev. Tuberc.* **47.** 635–646. [Spanish summary]. **2801**

Groups of g. pigs were inoculated with material containing *Mycobacterium tuberculosis* alone or mixed with *Monilia albicans*, *Streptococcus viridans*, *Staphylococcus aureus* or various organisms frequently found in the sputum of cases where oral hygiene has been poor. A significant shortening of the mean time to death from TB. was observed in those groups inoculated with *Str. viridans*, *Staph. aureus* or the "secondary organisms". These organisms were also recovered from the spleen, liver, and lymph nodes of the infected animals. The action seemed to be synergistic. *M. albicans* did not materially alter the course of the TB.

—R. S. DE ROPP.

PLUM, N. (1942). **Studies on the Occurrence of Avian Tuberculosis among Wild Birds, especially Gulls and Sparrows, and Rats and Hares.**—*Skand. VetTidskr.* **32.** 465–487. [In English]. **2802**

P. investigated possible ways of spread of avian TB. by examining 999 sparrows, 816 gulls, 1,175 wild and game birds of 87 other species, 534 tame pigeons, 846 rats, and 89 hares. One kestrel, one rook, one golden plover, four common scoters (*Oidemia n. nigra*), and 12 pheasants were found infected. Some 6% of the pigeons were diseased and 3·92% of three species of gulls. Details are given of the incidence (5·3–40%) in eight flocks of sparrows in contact with pigs affected with avian TB., whereas many other flocks of sparrows examined were largely uninfected. No infection was found in the hares examined. Among the rats the incidence of disease varied from 16·5–70%, dependent partly on age but more on their contact with tuberculous poultry.—C. V. WATKINS.

FRANCO, S. E., & GUREVITCH, J. (1942). **Atypical Findings on Animal Inoculation.**—*Amer. Rev. Tuberc.* **46.** 625–627. [Spanish summary]. [Authors' English summary copied *verbatim*]. **2803**

Two cases are reported in which inoculation into guinea pigs of material apparently containing tubercle bacilli did not produce inoculation tuberculosis.

SMITH, C. R. (1942). **Survival of Tubercle Bacilli in Books. How Contaminated Books May be Rendered Noninfectious.**—*Amer. Rev. Tuberc.* **46.** 549–559. [Spanish summary]. [Extract from author's English summary copied *verbatim*]. **2804**

1. Tubercle bacilli deposited in books and magazines were recoverable alive for from two weeks to three and one-half months. They were not recoverable at from three weeks to five months.

2. In general, they lived about as long on paper as on glass. They lived as long on printed as on blank paper. One type of paper was definitely inhibitory to the bacilli.

3. The period of recoverability was longer when the dose deposited was larger and during the winter season when average temperature and relative humidity were lowest.

*DOLD, H., & OCHSENREITHER, F. (1941). Ueber Tuberkelbazillen-feindliche Stoffe im Speichel. [**Protective Function of Saliva in TB.**]—*Z. Tuberk.* **85.** 326. [Abst. in *Amer. Rev. Tuberc.* **44.** No. 4. p. 106 of absts., copied *verbatim*. Signed : G. C. L.] **2805**

Saliva has the faculty of inhibiting the growth of diphtheria bacilli and of transforming them into pseudo-diphtheria bacilli. It has similar effects on other bacilli. Experiments are reported which were done to show the effect of saliva on tubercle bacilli. The growth of tubercle bacilli on culture media was delayed or even completely inhibited if the tubercle bacilli emulsion had been mixed with saliva. It was found that the tubercle bacilli were killed by the saliva in some cases. The inhibiting substances react to heat differently in different persons and differently at different times in the same person. Contrary to the opinion of other authors, the thiocyanides do not seem to be the inhibiting substances.

I. SEIBERT, F. B., & NELSON, J. W. (1943). **Electrophoresis of Serum. Serum Proteins in Tuberculosis and Other Chronic Diseases.**—*Amer. Rev. Tuberc.* **47.** 66–77. [Spanish summary]. **2806**

II. SEIBERT, F. B., NELSON, J. W., & SEIBERT, M. V. (1943). **Correlation of Extent of Tuberculosis with Amount of Polysaccharide in the Serum.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 219–222. **2807**

I. Changes in the serum proteins of rabbits and human beings infected with TB. were studied by the Tiselius electrophoretic technique. The previously recorded [see *V.B.* **12.** 588.] regular rise in the β-globulin fraction of tuberculous rabbit serum was confirmed. It was found that a consistent decrease in the percentage of serum albumin always accompanied this rise, both changes being apparently proportional to the stage of the disease. A possible relationship of constitutional hereditary factors to the β-globulin response to TB. was suggested by the fact that uninfected rabbits of a naturally resistant family were found to have significantly less β-globulin in their sera than had rabbits from naturally susceptible families.

The conspicuous serum protein changes found in cases of human TB. were a decrease in albumin, an increase in γ- and, in many cases, α-globulins, and the appearance of an unknown component which is under investigation. A study of sera from six cases of sarcoidosis and three of advanced leprosy revealed a considerable rise in γ-globulin in the former disease, and a great increase in both α- and γ-globulin in the latter.

II. The polysaccharide content of the serum of tuberculous human patients was found to be increased, the rise being to some extent proportional to the extent and course of the disease. Serum-protein fractions, isolated electrophoretically, all contained increased polysaccharide. These changes could not be correlated with an increase in the total protein content of the serum, nor did they appear to be directly related to previously recorded serum protein changes [see I].

—J. LOCHIEL MCGIRR.

MCINTOSH, C. W. (1939). **Johne's Disease.**—*Canad. J. comp. Med.* **3.** 182–185. **2808**

The author briefly reviews the history and discusses the disease. In an attempt to eliminate the nonspecific

reactions frequently present when johnin, prepared from media containing extracts of other acid-fast organisms, is employed as a diagnostic agent, *Mycobacterium johnei* was acclimatized to grow on synthetic medium, and from filtrates of such cultures, a purified protein derivative was prepared which gave well marked reactions in sensitized g. pigs with the practical elimination of nonspecificity. Johnin P.P.D. has been used with encouraging results in several infected herds. —L. M. HEATH.

ALLIN, A. E. (1942). **Cat-Bite Wound Infection.** —*Canad. med. Ass. J.* **46.** 48–50. **2809**

A definite clinical entity in human beings is described, due to cat bite and infection with an organism belonging to the genus *Pasteurella*. Rapid development of inflammation is followed by local or regional abscess formation, and convalescence is usually prolonged. The causative organism is harboured in the mouth and respiratory tract of healthy and sick cats. Six cases in the literature are reviewed and three new cases described. Bacteriologists should be on the watch for pasteurella in wound material, especially from cat-bites, and the clinician should realize that such wounds may not respond readily to the usual treatment.—R. G.

SEVER, J., & SCHNEIDER, L. (1940). A Voldagsen-typusú sertésparatyphus elleni vaccinás oltások kísérleti eredményei. [**Experimental Results of Vaccination against Voldagsen Type Paratyphoid in Swine**].—*Közl. Összehas. életö- és kórtan Köréböl.* **29.** 1–11. **2810**

Protective vaccination with formalinized whole cultures of *Salmonella typhi-suis* was carried out. The incidence of the infection was controlled to some extent, but no conclusive results were obtained.

[Further to the explanatory note in the abst. of a paper by SEVER *et al.* (*V. B.* **12.** 264.), it may be noted here that German workers generally refer to two types of swine paratyphoid organisms, *viz*, *Salmonella suipestifer* Voldagsen type and *S. suipestifer* Kunzendorf type. In 1935, the Salmonella Subcommittee of the Nomenclature Committee of the International Society for Microbiology (*V. B.* **5.** 63.) recognized the following swine paratyphoid organisms :– *S. typhi-suis* and *S. typhi-suis* var. *voldagsen*, and *S. cholerae-suis* and *S. cholerae-suis* var. *kunzendorf*. In 1939, the same Subcommittee omitted the nonspecific variants *voldagsen* and *kunzendorf* from their revised Antigenic Scheme (*V. B.* **11.** 427). In 1941, KAUFFMAN (*V. B.* **13.** 156.) also omitted these two variants from his revised Scheme, while pointing out that the European (Kunzendorf) strain of *S. cholerae-suis* had been regarded as monophasic and the American strain (*S. cholerae-suis*) as diphasic, but that BRUNER & EDWARDS (*V. B.* **11.** 80.) had reported that the majority of the American strains examined were monophasic.

In the *Vet. Bull.*, *S. suipestifer* Voldagsen type is referred to as *S. typhi-suis*, and *S. suipestifer* Kunzendorf type as *S. cholerae-suis*.—Ed.]—J. CSONKA.

BORMAN, E. K., WHEELER, K. M., WEST, D. E., & MICKLE, F. L. (1943). **Salmonella Typing in a Public Health Laboratory.**—*Amer. J. publ. Hlth.* **33.** 127–134. **2811**

The value of salmonella typing to differentiate animal types from human types is discussed and the methods used are given.

Four species, *S. california*, *S. pullorum*, *S. worthington* and *S. kentucky*, all of animal origin, were " the first recorded and amply confirmed isolations from man ". Two new types, *S. hartford* and *S. simsbury*, recorded from man, were possibly of animal origin.—M. H. K.

—. (1943). **The Laboratory Diagnosis of Enteric Fever, Dysentery and Bacterial Food Poisoning.**—*Mon. Bull. emerg. publ. Hlth Lab. Serv.* **2.** 59–63. **2812**

Diagnosis of enteric fever due to *Salmonella paratyphi* B or to *S. typhi* is best performed by isolation of the infective agent from blood or faeces. Serum should be tested both for H and O agglutinins. In the case of bacillary dysentery, the causal organisms should be searched for as soon as possible after the sample is obtained. Serological tests with this organism are less reliable than are similar tests for enteric fever. Bacterial food poisoning may be due to toxins present in the food before it is consumed or to infections with organisms of the salmonella group. Cultures should be made both from food and the patient's faeces.—R. S. DE ROPP.

BURROWS, W. (1942). **Oxidation-Reduction Potentials in Salmonella Cultures. IV. A Note on the Relation of Observed Potentials to pH.**—*J. infect. Dis.* **71.** 106–109. [For part III, see *V. B.* **12.** 574]. **2813**

The relationship between reducing potential and pH in isolated reversible oxidation-reduction systems may be shown theoretically to be such that increasing alkalinity results in an increased negativity, but the numerical value of such relationship can only be developed empirically for a complex biological system such as a bacterial culture. Experiments carried out on five strains each of *Salmonella typhi*, *S. cholerae-suis*, and *S. enteritidis*, grown in buffered broth at various pH values compatible with growth, showed that the fall of potential for each unit rise of pH was closely approximated to the value of 60 millivolts which has been found to apply in certain biological systems other than bacterial cultures.—E. COTCHIN.

HUDDLESON, I. F., SAN CLEMENTE, C. L., STAHL, W. H., HUTCHINGS, L. M., & HAMANN, E. E. (1943). **Studies in Brucellosis. II. A Series of 5 Papers.**—*Tech. Bull. Mich. agric. Exp. Sta.* No. 182. pp. 80. [For previous series, see *V. B.* **12.** 332]. **2814**

Electrophoretic Studies of the Proteins of Bovine Serums with Respect to Brucella [SAN CLEMENTE, C. L., & HUDDLESON, I. F.]. This is an extensive study of the electrophoretic patterns obtained from normal and brucellosis-infected sera by means of the electrophoresis apparatus of Tiselius, the schlieren scanning method of Longsworth being used. The mobilities and concentrations of electrophoretically distinct protein components have been computed from these patterns. Vaccination of calves with strain 19 caused only slight change in the normal serum distribution. No significant or permanent change could be demonstrated to explain the immunizing property of strain 19. Absorption of an antiserum of high titre showed the γ-globulin to be the associate of brucella antibody. An examination of precipitants shows that a possible method may be devised to obtain γ-globulin which might be further purified to concentrate brucella antibody. A large amount of detail is given in the paper which should be consulted in the original.

The Immunisation of Guinea Pigs Against Brucella Infection [HUDDLESON, I. F.]—H. describes the immunization of g. pigs by means of a soluble fraction obtained from live cells of *Br. abortus* and *Br. suis* which are broken down in a Booth and Green crushing mill. In 24 separate experiments with *Br. abortus*, totalling 247 g. pigs, only 23 (9·03%) became infected after inoculation with 152–3,840 *Br. abortus* organisms. Of 238 controls inoculated at the same time, 131 (63·44%) became infected. 3·5 mg. of the dried extract were given in three inoculations at three-day intervals. The inoculations were made either subcutaneously or intradermally [not shown separately in experiments]. The test dose was given subcutaneously

in 1 ml. of suspension 3–4 weeks later. Agglutination titres arising from the inoculation of extract were not high and disappeared in 5–6 weeks. There was no toxic reaction and opsonins disappeared after the fourth week. Primary intracutaneous injection produced no local reaction, but subsequent injections showed rapid development of skin sensitivity. Following inoculation of the virulent test dose, little or no agglutinins appeared in immunized animals, but marked titres occurred in those which had been inoculated with extract but did not prove to be immune. The duration of immunity appears to be about six months. The extract is easily destroyed by most antiseptics and heat. H. concludes that it is not necessary to inject live brucella organisms to produce an active immunity to brucellosis.

Catalase Activity of the Species of Brucella *as a Criterion of Virulence* [HUDDLESON, I. F., & STAHL, W. H.]—The virulence of each of the three species of *Brucella* is directly associated with their catalase activity. *Br. suis* is the most active, or contains the largest amount of catalase, and *Br. abortus* is the least active. Activity, or amount of catalase, decreases as the degree of dissociation of a particular culture increases and as the virulence of a smooth culture decreases. Rough and low-virulence cultures of *Br. melitensis* often show about the same activity as *Br. abortus* cultures of high virulence. The method of estimating catalase activity is described and each culture examined was subjected to virulence tests and to tests for the presence of dissociants by the reflected oblique light method. *Br. suis* may be differentiated from *Br. melitensis* and *Br. abortus* by its high catalase activity, but an overlapping of values occurs between R type of *Br. melitensis* and S type of *Br. abortus*. The method should have considerable practical application, but the accuracy of the test depends on the careful observance of a number of factors.

A Study of the Virulence of Brucella Abortus *for the Guinea Pig and Cow* [HUTCHINGS, L. M.]—The experiments were designed to ascertain the minimum infecting dose of various strains of *Br. abortus* and *Br. suis* for g. pigs, and a suitable infective dose of *Br. abortus* for pregnant heifers. 0·1% of tryptone solution was found to be the most suitable medium for suspensions. Each dose was given subcutaneously to three g. pigs which were killed after 30 days. Ten organisms were found to produce infection in most of the g. pigs. Continued passage of *Br. abortus* through g. pigs resulted in a slight increase of virulence in all cultures. Strain 19 exhibited the lowest virulence of any culture of *Br. abortus* studied, a massive dose of 470,000,000 being required to produce infection. 4,627,500 viable organisms of virulent *Br. abortus* deposited in the conjunctival sac readily infected susceptible pregnant heifers.

A Study of Bang's Disease in Cattle in a Large Dairy Herd [HAMANN, E. E.]—Of 58 cows showing an agglutination titre above 1 : 100, 31% became permanent non-reactors during a five-year period. 33 of these animals showed a titre of 1 : 25 or higher in the milk on one or more examinations. Of 23 cows in the same herd classified as suspicious, *i.e.* with a titre of less than 1 : 100, only two became reactors and none aborted.—S. J. GILBERT.

BIRCH, R. R., GILMAN, H. L., & STONE, W. S. (1943). **The Pathogenicity of Brucella abortus Strain 19 for Sexually Mature Cows.**—*Cornell Vet.* **33.** 198–208. **2815**

Eight animals from brucella-free herds were exposed to infection by ingestion of strain 19. 10 ml. of a suspension equal to that of the standard Bureau of Animal Industry vaccine were administered in the food at frequent intervals. At least five cattle showed evidence of a degree of invasion. One cow gave birth to a weak premature calf. The placenta was retained and one of two g. pigs inoculated with uterine exudate proved to be infected. Although there is as yet no proof that vaccination of calves in clean herds with strain 19 has resulted in the transference of brucella to mature cows, very little careful work has been done and negative results should be extensive to have significance.

—S. J. GILBERT.

MITCHELL, C. A., & MOORE, T. (1942). **Viability of Brucella abortus Strain 19 in Vaccine.**—*Canad. J. comp. Med.* **6.** 292–295. **2816**

Experiments to determine the effect of storage upon the viability of *Br. abortus* strain 19 were conducted under the following conditions :– (1) under varying conditions of pH of the suspending medium at various temperatures ; (2) in containers of ordinary glass, waxed glass, and alkali-free glass at room temperature, with and without agitation ; (3) under varying conditions of temperature and pH of the suspending medium in ordinary glass and alkali-free glass containers ; (4) when carried in the luggage trunk attached to an automobile from 8 a.m. until 9 p.m. in very warm weather, and (5) when desiccated, over calcium chloride, while suspended in (a) normal saline, (*b*) distilled water.

The results appear to indicate that a much higher percentage of organisms remain viable for a greater length of time when the vaccine is adjusted and buffered to a pH between 6 and 7, and stored at a temperature of 1°C.

Freezing and drying under the conditions described was rapidly fatal to a very high percentage of the organisms.—THOS. MOORE.

MITCHELL, C. A., & MOORE, T. (1941). **Brucella abortus (Strain 19) and Calfhood Vaccination.**—*Canad. J. comp. Med.* **5.** 50–55 79–83 & 106–111. **2817**

It is noted that Jersey calves are more susceptible to the vaccine than those of other breeds and require a smaller initial dose. Evidence is also presented to show that the vaccine is harmless. Serological reactions are, however, obtained shortly after vaccination, but these disappear eventually. The organisms are not harboured in the mammary gland nor are they present in vaginal discharges after parturition. Susceptible animals in contact with vaccinated animals remained healthy.

The results following vaccination of calves in seven different infected herds are given in tabular form.

The author concludes that :– *Br. abortus* strain 19 does not set up a progressive infection when inoculated into calves ; irrespective of age or time of pregnancy, cattle exposed to vaccinated animals do not become infected with strain 19 ; calves which become serologically positive following vaccination are resistant, while calves which fail to react are as susceptible as uninoculated controls ; calves should be tested 30 days after vaccination and those which fail to react should be re-vaccinated.—L. M. HEATH.

EMMINGER, A. C., & SCHALM, O. W. (1943). **The Effect of Brucella Abortus on the Bovine Udder and Its Secretion.**—*Amer. J. vet. Res.* **4.** 100–109. **2818**

Milk samples from udders infected with *Br. abortus* did not differ significantly from samples from normal udders. No gross lesions were observed in brucella-infected udders, but histopathological changes were noted in 17 out of 19 quarters that had harboured *Br. abortus* for periods of 16–324 days. The changes consisted of an exudation of neutrophiles into the alveolar lumen associated with a tendency to desquamation of epithelial cells. Dense accumulations of lympho-

cytes and plasma cells were commonly found in the interalveolar tissue, occasionally accompanied by proliferation of connective tissue elements and changes in the supramammary lymph nodes.—R. S. DE ROPP.

SAN MARTÍN SOTO, V. (1942). Infección por brucellas en la leche de establos del sector urbano de Santiago. **[Brucella Infection in the Milk of Stalled Cows in Urban Districts of Santiago, Chile].**—*Rev. chil. Hig. Med. prev.* **5.** 25–38. **2819**

Agglutination tests were made on milk samples from 400 stalled cows in 60 herds. Twenty-five (6·2%) positive reactions, with titres of 1 : 25–1 : 800, were obtained. Seven strains of *Br. abortus* were isolated from seven cows with titres higher than 1 : 50. Thirty-eight blood-aggln. tests made on persons in contact with the cattle yielded nine (23·6%) positive reactions, with a maximum titre of 1 : 100.

PURRIEL, P., PIAGGIO, A. A., & RISSO, R. (1942). Investigaciones sobre infección brucelósica realizadas en las usinas de pasteurización de leche de Montevideo "Conaprole". **[Incidence of Brucellosis in the Personnel of a Pasteurizing Plant in Montevideo].**—*Arch. urug. Med.* **20.** 225–231. **2820**

Skin tests were made on the workers at a large pasteurizing plant, *Brucella melitensis* antigen being used. Positive reactions were shown by 130 (13·6%) of 955 men and by 60 (27·5%) of 218 women. An unusually high incidence amongst the office workers, who had contact with office papers circulated in parts of the plant open to infection, was noted. None of the reactors had shown clinical symptoms of infection, this being suggested as due to infection with small doses. Further tests showed that the high incidence of brucella infection did not increase the morbidity of tuberculous lesions.

MAZZA, S., & HERRERA, J. C. (1941). La brucelosis en el Departamento Andalgalá de la Provincia de Catamarca. **[Undulant Fever in Catamarca Province, Argentina].**—*Prensa méd. argent.* **28.** Reprint pp. 5. **2821**

A brief account of *Brucella melitensis* infection in 41 persons, all of whom had had contact with goats and had consumed raw goat's milk and fresh cheese made from goat's milk.

ANGLE, F. E., ALGIE, W. H., & MORGAN, D. (1942). **Brucellosis: Studies Emphasizing Strain Variation in Serological Testing.**—*J. Lab. clin. Med.* **27.** 1258–1263. **2822**

Blood and serum from 34 patients with undulant fever was used for a series of opsonocytophagic and agglutination tests. Twenty different smooth strains of brucella were employed to provide the bacterial suspensions used in these tests. Very marked variations in agglutination titre and opsonocytophagic index were obtained from the same serum when it was tested against suspensions of the different strains. Whether strains were *Br. abortus*, *Br. melitensis* or both is not stated.—R. S. DE ROPP.

WISE, B., & KERBY, G. P. (1943). **Phenomenon of Local Skin-Reactivity (Shwartzman) to Organisms of the Brucella Group.**—*J. Immunol.* **46.** 225–233. **2823**

Three strains of *Br. suis*, two of *Br. melitensis*, and two of *Br. abortus* were tested for their ability to elicit the Shwartzman phenomenon. Material obtained from the supernatant liquid after centrifugation of the *Br. suis* strains gave a positive result when used for the skin preparatory dose, similarly prepared material from suspensions of *Bacterium coli* being used as the provocative dose. The brucella strains all lacked the power to act as the provocative factor. Previous vaccination with *Bact. coli* or *Br. suis*, attended by the appearance of serum antibodies in high titre, appeared to have no influence on the production of the Shwartzman phenomenon.—R. S. DE ROPP.

BOSWORTH, T. J. (1943). **On a New Type of Toxin Produced by *Clostridium welchii*.**—*J. comp. Path.* **53.** 245–255. **2824**

Strains of *Cl. welchii* which produce a toxin distinct from that of any of Wilsdon's four types, were obtained from the intestinal contents of a dead calf and also from normal calf faeces. The dead calf was one of three from the same premises. All had died when less than a week old and after showing symptoms of acute intoxication.

The main lesions common to the three calves were marked enteritis, especially in the small intestine, patchy haemorrhage in the abomasal mucosa, and petechial haemorrhages in the mesentery, lungs, and epicardium. The intestinal contents of the two cases examined were shown by mouse inoculation to contain a toxin which was not neutralized by antitoxins of the known types of *Cl. welchii*.

The *in vitro* toxin produced by the new strains was intensively examined. The only haemolysin demonstrable was that of its α fraction. Besides the α fraction, another toxin was present which was called "ι". This toxin reaches its maximum concentration after 18–24 hours' growth. The intravenous M.L.D. for mice varied from 0·025–0·1 ml. It is heat labile (65°C.), but no loss in potency was observed from exposure to room temperature, to refrigeration, or to drying. It is not activated by trypsin. In mice it causes powerful muscular spasms affecting mainly the back, hind legs, and tail. Death without any haematuria occurs in 1–24 hours depending on the dose. A characteristic reaction follows the intradermal injection of the toxin into g. pigs. A pallor just discernible 18 hours after the injection becomes more distinct on the third day. This reaction was not affected by α, β, or ϵ antitoxins. Whereas type A antitoxin could not neutralize the toxin from the new strains, the antitoxin prepared from the latter could neutralize type A toxin. Thus culture filtrates of the new type contain α toxin and another newly described toxin called "ι", which is distinctly lethal and necrotizing.

It is concluded that, according to their toxin, the newly described strains form a type of *Cl. welchii* additional to the types classified by Wilsdon. There is no evidence at present to prove that this organism is a specific cause of enterotoxaemia or other disease. —J. KEPPIE.

HALL, I. C. (1943). **The Danger of Botulism.**—*Amer. J. publ. Hlth.* **33.** 818–820. **2825**

Recent observations in the Rocky Mountains region of the U.S.A. have revealed 32 human outbreaks of botulism causing 83 deaths as well as several outbreaks in donkeys, poultry, and mink. Most of the outbreaks were traced to improperly home-canned vegetables. In order to safeguard poultry and other domestic animals, the necessity for effective destruction of contaminated material is stressed.—D. D. OGILVIE.

DOZIER, H. L. (1943). **Occurrence of Ringworm Disease and Lumpy Jaw in the Muskrat in Maryland.**—*J. Amer. vet. med. Ass.* **102.** 451–453. **2826**

D. records the occurrence in muskrats of six cases of a fungous disease, probably caused by *Trichophyton mentagraphytes*, and two cases of actinomycosis affecting the bones of the jaw and due to "*Streptothrix actinomycoses bovis*" [*Actinomyces bovis*].—ISOBEL W. BURTON.

EMMONS, C. W. (1943). **Coccidioidomycosis in Wild Rodents. A Method of Determining the Extent of Endemic Areas.**—*Publ. Hlth Rep., Wash.* **58.** 1–5. **2827**

From a survey of almost 2,000 trapped rodents, E. concludes that such animals constitute an important reservoir of coccidioidomycosis, and suggests that examination and culture of the lungs from samples of the rodent population (particularly of the susceptible species of *Perognathus*) offer a dependable method of determining whether the infection is present in a locality.—ISOBEL W. BURTON.

*TOMPPERT, H. (1940). Die durch Schimmelpilze verursachten Erkrankungen unserer Haustiere. [**Mycoid Infections in Domestic Animals**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 449]. **2828**

Mould infections may be sporadic or enzootic, and usually lead to death of the affected animal. All species are affected, birds especially. The most usual sites of infection are the air-passages and organs of the digestive tract, though further dissemination by metastatic spread may occur. The thesis deals with infection by the following moulds :– *Aspergillus fumigatus, A. flavus, A. nidulans, A. niger, A. glaucus, A. candidus, Mucor pusillus, M. racemosus, M. corymbifer, M. conoideus, Absidia ramosa, Rhizopus rhizopodiformis,* and *R. suinus. Penicillium* appears to be completely nonpathogenic. —J. G. CARR.

BEEUWKES, H. (1941). **The Occurrence of Pleuro-pneumonialike Microorganisms Causing Arthritis Isolated from Healthy White Rats.**—*Natuurw. Tijdschr. Ned.-Ind.* **101.** 323–324. [In English]. **2829**

Material from the nasal mucous membrane of healthy white rats was sown into horse-serum broth, and 0·5 ml. of the broth was inoculated intradermally into the pad of a foot of 60 other white rats. Thirty of these developed a suppurative arthritis in the infected limb. From the pus, pleuro-pneumonia-like organisms were cultured and arthritis produced in inoculated rats. In five cases, *Streptobacillus moniliformis* was recovered in association with the pleuro-pneumonia-like organisms. —B. WEITZ.

LANDY, M., LARKUM, N. W., OSWALD, E. J., & STREIGHTOFF, F. (1943). **Increased Synthesis of p-Aminobenzoic Acid Associated with the Development of Sulfonamide Resistance in Staphylococcus aureus.**—*Science.* **97.** 265–267. **2830**

A quantitative comparison was made of the amounts of *p*-aminobenzoic acid (PAB) synthesized by sulphonamide-sensitive and -resistant strains of *Staphylococcus aureus.* It was found that a sulphonamide-resistant strain of *Staph. aureus* grown in chemically defined PAB-free medium synthesized far more PAB than did parent (sulphonamide-sensitive) strains of the same organism. The increased PAB synthesis was found to be retained for many generations, this being supporting evidence of the permanence of sulphonamide-fastness.

It was also shown that increased synthesis of PAB took place in the presence of sulphonamides (sulphanilamide and sulphadiazine) in the culture medium. The quantity of PAB synthesized by resistant strains appears sufficient to account for their resistance to sulphonamide drugs.

That other organisms may acquire resistance to sulphonamides without increasing their production of PAB was also shown.—M. H. WEDDELL.

*QUIROGA, S. S., & MONTEVERDE, J. (1940). Producción de ácido cianhídrico por Pseudomonas aeruginosa (B. piocianico). [**Production of HCN by** *Pseudomonas pyocyanea*].—*Rev. sud. amer.* pp. 565–573 & 618–620. [Abst. from abst. in *Gac. vet., B. Aires.* **3.** 26]. **2831**

Five strains of *Ps. pyocyanea* were found to produce HCN. As this was produced on synthetic media, the formation was independent of the production of pigment. Assayable amounts were produced only on media containing mixed amino acids.—J. G. CARR.

MOCHTAR, A., & VAN VEEN, A. G. (1941). Over blauwzuur-vorming door bacteriën. [**Formation of Hydrocyanic Acid by Bacteria**].—*Geneesk. Tijdschr. Ned.-Ind.* **81.** 874–879. [Abst. in *Brit. Chem. Physiol. Abstr.* A., III. Feb. 1942. p. 169, copied *verbatim.* Signed : S. C.] **2832**

Examination of bacteria from the blood from a 7-day-old corpse showed that strains of *Pseudomonas, Citrobacter, Proteus,* and *Alkaligenes* were present, and each, especially the first, produced HCN (40–80 mg.–%) when grown in fresh sheep, ox, or human blood. The amount produced in about 10 days approximated to the lethal dose and must therefore be taken into account in suspected cases of HCN poisoning.

*BORDET, J., & BORDET, P. (1941). Le rôle du calcium dans la dissociation microbienne. [**The Role of Calcium in Bacterial Dissociation**].—*Schweiz. Z. Path.* **4.** 321–331. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 426]. **2833**

Excess Ca added to the medium causes a considerable increase in the dissociation of the phases of bacteria [species not stated in abstract]. The effect is seen in low concentrations, $CaCl_2$ having an optimal effect in this respect at a concentration of 1 : 5,000. Additional Ca slows the rate of dissociation and reduces the amount of bacterial growth. Strontium and barium have the same effect. Experiments to determine the cause of this action led to no definite conclusion. —J. G. CARR.

KNAYSI, G., & MUDD, S. (1943). **The Internal Structure of Certain Bacteria as Revealed by the Electron Microscope—A Contribution to the Study of the Bacterial Nucleus.**—*J. Bact.* **45.** 349–359. **2834**

The internal structures of *Brucella abortus, Pasteurella pestis,* and species of *Neisseria, Staphylococcus,* and *Streptococcus* were studied by the electron microscope. Investigations suggested that bacteria may contain nuclear material, the state of dispersal of which may change with the development of the cell.—R. S. DE R.

See also absts. **2950-2952** (mastitis), **2974** (staphylococcus), **2972** (cocci), **2988** (strangles), **3004** (anthrax), **2893, 2953, 2954, 2979, 2981, 2983, 2984** (TB.), **2955** (*Corynebact. pyogenes*), **2891, 2920** (salmonella), **2982** (haemoglobinophiles), **2984** (brucella), **2947-2949** (antibacterial substances).

DISEASES CAUSED BY PROTOZOAN PARASITES

EVELETH, D. F. (1943). **Histomoniasis in Broilers.**—*Vet. Med.* **38.** 148–149. **2835**

E. produces evidence of the spontaneous occurrence n chicks of organisms similar to *Histomonas,* in hepatic and caecal tissue. He cites the case of an owner who reported 250 deaths from a flock of 500 birds, which E. considers were due to uncomplicated histomoniasis. A four-week-old chick showing symptoms and passing the organism in the faeces was placed in a cage with a 14-week-old bird which, within a week, became depressed and diarrhoeic, and passed numerous organisms in the faeces. The older bird showed typical symp-

toms and, at P.M. examination, lesions of blackhead. Four-day-old chickens fed faecal material from infected chickens were passing organisms in the faeces at the end of eight days and symptoms developed later. There was considerable loss in weight as compared with the controls. Good sanitary methods, which eliminated caecal worms and prevented coccidiosis, appeared to prevent distribution of histomoniasis within the flock. —C. HORTON SMITH.

MELLO, G. B. (1940). Verificação da infecção natural do gato (*Felix domesticus*) por um protozoario do genero Leishmania. [**Natural Infection of a Cat with *Leishmania* sp.**]—*Bras.-med.* **54.** 180. **2836**

Ulcerations of the nose and ears were observed in an adult cat, born and raised on a farm in the state of Pará on the Amazon estuary, Brazil. Numerous leishmania-like organisms were found in the lesions. Repeated examination of the peripheral blood failed to detect flagellates. When material from the lesions was sown on Noeller's medium, numerous leptomonas forms were observed after five days. No other flagellates were seen up to 30 days of culture. Histological sections of biopsy material showed numerous leishmania and intense mononuclear infiltration. Leishmania were not found in liver puncture material.

Nymphs and adults of *Triatoma brasiliensis*, placed on the lesions, showed leptomonas in the digestive tract 6–15 days later, persisting up to about ten days.

No infection was produced in a dog, cats, and a variety of experimental animals inoculated with blood or lesion material from the infected cat.

It is concluded that infection was due to a species of *Leishmania*, probably *L. brasiliensis* or *L. chagasi*.

No other cases of leishmaniasis could be traced in the region. *Phlebotomus*, especially *P. longipalpis*, was abundant.

*BERNARDINI, O., & BARBONI, E. (1941). Osservazioni sul comportamento di alcuni roditori da laboratorio di fronte alla inoculazione per os di un tripanosoma patogeno (Tryp. Evansi). [**Reaction of Laboratory Animals to Peroral Infection by *Trypanosoma evansi***].—*Riv. milit. Med. Vet., Roma.* **4.** 59 & 72. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 288]. **2837**

In order to test the ability of trypanosomes to penetrate mucous membranes, small quantities of blood infected with *T. evansi* were administered intra-orally to various species of laboratory animals. Whilst 100% of white rats and 27·5% of g. pigs under experiment contracted infection, all mice and rabbits proved resistant. Repeated intra-oral administration of infected blood to animals which were resistant to this method of infection failed to confer any immunity, all animals treated in this way reacting to intraperitoneal infection in the same way as untreated controls.—U. F. R.

MORGAN, B. B., & NOLAND, L. E. (1943). **Laboratory Methods for Differentiating Trichomonas Foetus from Other Protozoa in the Diagnosis of Trichomoniasis in Cattle.**—*J. Amer. vet. med. Ass.* **102.** 11–15. **2838**

It is pointed out that material sent in for examination for *Trichomonas foetus* may contain other flagellates which closely resemble the trichomonad. The forms most difficult to distinguish from trichomonads are *Bodo foetus*, *Spiromonas augusta*, *Cercomonas crassicauda*, and *Lembus pusillus*. Whilst these organisms grow readily in cultures incubated at 30°C., they do not multiply in cultures incubated at 37°C., although the spiromonads and cercomonads will survive a few days at the latter temperature. *T. foetus* can rarely be found after 48–72 hours of cultivation in egg-slant medium, either at 30° or 37°C., as bacterial contamination kills the organisms, but multiplication occurs at 37°C. and trichomonads are best detected in 24-hour cultures.

It is suggested that, in examining material for *T. foetus*, both fresh material and cultures should be used, and that in examining cultures, two small drops of material should be placed on a slide. One drop should be examined fresh, and the other covered with a coverglass on which has been put a small drop of saturated aqueous mercuric chloride solution, and examined with the oil immersion lens: organisms fixed in this way are relatively free from distortion and from clumps of bacteria.—U. F. RICHARDSON.

RUTHERFORD, R. L. (1943). **The Life Cycle of Four Intestinal Coccidia of the Domestic Rabbit.**—*J. Parasit.* **29.** 10–32. **2839**

In this valuable paper, the endogenous phases of the life-cycles of *Eimeria irresidua*, *E. magna*, *E. media*, and *E. perforans* are described. The sporozoites are found in the lumen and epithelium of the intestine within a few hours of infecting the rabbits. The sporozoites remain in an infective condition for as long as two days, so that young schizonts are found in association with older ones. The four species each produce two types of merozoites, termed the A and B types, and each type gives rise to first and second generation merozoites. With the exception of the first generation type A of *E. irresidua*, the first and second generation type A merozoites are large and there are 2–16 merozoites in each schizont. The first and second generation of type B, with the exception of the first generation of *E. irresidua*, are small and there are 12–78 merozoites in each schizont. It appears possible that first generation, type A merozoites produce a second generation of type A merozoites and microgametocytes and that merozoites of type B produce a second generation of type B merozoites and macrogametocytes. First generation merozoites of types A and B require 4–6 days to mature, according to the species, while the second generation merozoites of both types require 1–3 days, according to the species. The lengths of time required for the completion of the endogenous cycle vary: *E. irresidua* requires 9–10 days, *E. magna* 7 days, *E. media* 6 days, and *E. perforans* 5 days.—C. H. S.

FARR, M. M. (1943). **Resistance of Chickens to Cecal Coccidiosis.**—*Poult. Sci.* **22.** 277–286. **2840**

That chickens reared under ordinary flock conditions become resistant to caecal coccidiosis has been known for a number of years. Chickens reared on wire floors and under conditions of strict sanitation retain their susceptibility to infection with *Eimeria tenella*. Recently, it has been shown that a demonstrable immunity can be set up by the administration of controlled doses of sporulated oocysts. When F. administered daily doses of 1,000 sporulated oocysts of *E. tenella* to chickens for 15 days, or when 15,000 oocysts were administered in three doses of 1,000, 5,000, and 9,000 oocysts at five-day intervals, a high degree of resistance was produced. When birds with such an acquired resistance were kept under conditions which almost eliminated the possibility of extraneous infection for six months, it was found that they were still resistant to infection by *E. tenella*. A single heavy dose of oocysts failed to produce an effective resistance. [These results once again point to the possibility of attempting to plan husbandry so that chickens will acquire safely a natural resistance to *E. tenella* by receiving small regular doses of oocysts.]—C. HORTON SMITH.

*HERMAN, C. M., & JANKIEWICZ, J. (1942). **Reducing Coccidiosis in California Valley Quail during Captivity.** —*Calif. Fish Game.* **28.** 148–149. [Abst. in *Exp. Sta. Rec.* **88.** 251, copied *verbatim*]. **2841**

Fifteen California valley quail (*Lophortyx cali-*

fornica) infected heavily with coccidia (*Eimeria* spp.) at the beginning of the experiment were kept in elevated wire-bottomed cages. Daily examinations showed a gradual reduction, and by the end of 1 week very few oocysts could be found in the material from any of these birds, indicating that the larger number of parasites more likely to injure the health of the birds is maintained only with continual reinfection.

TRAGER, W. (1943). **Further Studies on the Survival and Development in vitro of a Malarial Parasite.**—*J. exp. Med.* **77.** 411–420. **2842**

T. has previously shown [*V. B.* **12.** 372—III.] that the survival *in vitro* of *Plasmodium lophurae* is favoured by a balanced salt solution of high potassium content, by aeration but not by a high oxygen tension, by an optimal density of parasites per cu. mm., by frequent renewal of the suspending medium, by concentrated duck erythrocyte extract, and by optimal concentrations of plasma or serum, of chick embryo extract, of glucose or glycogen, and of glutathione. Parasites survived five days as shown by exflagellation of male gametocytes, and six days as shown by infectivity under standard conditions. If calcium pantothenate (0·02 mg. per ml.) is added to the suspending medium and better aeration is obtained by gentle agitation on a rocking machine, and fresh uninfected erythrocytes are provided every other day, survival times can be increased to 10–16 days at 40°–41°C.—C. H. S.

LOTZE, J. C., & YIENGST, M. J. (1942). **Studies on the Nature of Anaplasma.**—*Amer. J. vet. Res.* **3.** 312–320. **2843**

From a study of blood stained principally with Wright's stain, and of blood exposed to a haemolysing agent (*e.g.* 0·5% acetic acid) which caused the anaplasms to swell and some to rupture before the erythrocytes were completely lysed, three different forms of anaplasms are described. The first type consists of spherical bodies with smooth outlines about 0·2–0·5μ in diameter; the second type is roughly spherical or ovoidal, measuring 0·6–0·9μ in diameter, whilst the third type is extra-erythrocytic, being usually attached to the outside of the corpuscles, but sometimes free in the plasma; it consists of rod-shaped structures about 1μ in length with a terminal knob-like structure, 0·2–0·3μ in diameter.

Whilst the smooth anaplasms appeared to be made up of a homogeneous material, the rough anaplasms contained a number of small sporoid bodies. Under the action of the haemolysing agent, it appeared that each rough anaplasm contained eight sporoid bodies.

A study of the size of anaplasms during the course of the disease indicated that a "size rhythm" occurred. For example, on a particular day the majority of infected erythrocytes contained small anaplasms measuring 0·2μ in diameter, on the following day 0·3–0·4μ; on the third day 0·4–0·5μ, and on the fourth day rough anaplasms measuring 0·6–0·7μ in diameter. On the fifth day relatively few or no rough anaplasms were present, and it is suggested that an infected erythrocyte does not remain in the bloodstream of the host for more than 3–4 days.

It is suggested that the anaplasm is a parasite which invades the erythrocytes, and eventually undergoes multiple division resulting in the production of eight small sporoid bodies, and that the extra-erythrocytic body may constitute the stage of the parasite which invades the corpuscles.—U. F. RICHARDSON.

VISHNEVSKIĬ, P. P. (1941). Rol' kontakta v zarazhenii krupnogo rogatogo skota ikterohemoglobinuriei. **[Role of Contact in Spread of Bovine Icterohaemoglobinuria —*Leptospira icterohaemoglobinuriae* Infection].**—*Veterinariya, Moscow.* No. 3. pp. 56–61. [French summary]. **2844**

Twenty calves of 2½–7 months old, imported from healthy districts, and placed in contact for 1–2 months with infected and convalescent animals, remained healthy, as did also 36 yearlings grazed for two months on pasture (10 hectares) which had been previously grazed by an infected herd. Instances are also recorded where the dam was infected and the calf remained unaffected and *vice versa*; in only a few instances were both dam and calf affected.

The author therefore concludes that, contrary to the general opinion, only a comparatively small percentage of animals contract infection, even after prolonged contact.

He strongly criticizes the papers of NIKOL'SKIĬ & DESYATOV [presumably the papers appearing in *Sovyet Vet.* no. 10. pp. 18–23. (1935), and in "Infectious Jaundice of Cattle (Work of 10th Plenary Session, Veterinary Section, Academy of Agricultural Science, Moscow, 1938)], of ANDREEV [(1937) *Sovyet. Vet.* no. 2. 62–69.], and of MIKHIN & AZHINOV [*V. B.* **7.** 419.], which emphasize that the infection is spread by urine, faeces, pastures, and water, and also by ticks, stinging insects, and rodents, although the results of their transmission experiments are, according to V., unconvincing.

The author's conclusions are based on clinical and P.M. findings only. Serum agglutination tests were not carried out; this somewhat invalidates his conclusions, as the occurrence of a latent, early form of icterohaemoglobinuria has been noted by several workers.—A. MOLDAWSKY.

ALICATA, J. E., & BREAKS, V. (1942). **Incidence of Leptospirosis among Dogs in Honolulu as Determined by Serological Agglutination Tests.**—*J. Wash. Acad. Sci.* **32.** 305–308. **2845**

Thirty-nine of 100 dogs examined in Honolulu gave positive reactions to microscopic agglutination tests for leptospirosis, some giving stronger reactions to *L. icterohaemorrhagiae* and others to *L. canicola*. Leptospira were recovered from a dog suspected to have died from *L. canicola* infection. Eight animals were encountered with agglutination titres between 1 : 10,000 and 1 : 30,000, and of these, the animals giving stronger reactions to *L. icterohaemorrhagiae* were jaundiced, whilst those giving stronger reactions to *L. canicola* were anicteric, but showed general malaise, muscular tremor, and dehydration. An examination of local rats revealed only a 2·6% infection with *L. icterohaemorrhagiae*; it is suggested that there is little epizoological relationship between murine and canine infections with this organism.—U. F. RICHARDSON.

—. (1943). **Weil's Disease in Great Britain, 1939–1942.**—*Mon. Bull. emerg. publ. Hlth Lab. Serv., Lond.* **2.** May. pp. 40–44. **2846**

In an examination of sera from patients suspected to be suffering from Weil's disease, Professor GARDNER, working for the emergency public health laboratory service at Oxford during the years 1939–1943, has obtained 58 positive serum reactions to *Leptospira icterohaemorrhagiae*, of which 12 were from miners and eight from agricultural workers. It is pointed out that this gives no indication as to prevalence of human infection in this country, since jaundice, generally the first sign to arouse suspicion, occurs in only 60% of cases, and laboratory tests are not always performed even on jaundiced persons. *L. canicola* has never been isolated in Great Britain, but fairly clear evidence exists of a canine and human leptospiral infection differing from both Weil's disease and *L. canicola* infection.

For the laboratory diagnosis of Weil's disease, a well proved strain of *L. icterohaemorrhagiae* is used,

cultivation being carried out in 12% rabbit serum in glass-distilled water, copper-distilled water being inimical to the organisms. 0·25% formalin is added to the cultures which are then filtered to remove a slight deposit, probably denatured proteins. One batch of suspensions made in this way served for more than two years' routine work.—U. F. RICHARDSON.

VAN RIEL, J. (1942). La leptospirose en Afrique. **[Leptospirosis in Africa].**—*Rec. Trav. Sci. méd. Congo Belge.* No. 1. pp. 7–22. **2847**

Leptospira isolated from human beings in the Kivu in the Belgian Congo, which are claimed to belong to the species *L. icterohaemorrhagiae*, constitute the first proof of it sexistence in the south of the continent. The human disease was characterized by meningitis and not by the classical symptom of jaundice. The organism was not pathogenic to g. pigs. By agglutination tests, four groups of organisms were isolated, one of which is classified as typical *L. icterohaemorrhagiae*, one as atypical *L. icterohaemorrhagiae*, one as *L. canicola*, and one as an independent species. Examination of rats failed to reveal leptospiral infection, but 5·79% of dogs examined gave positive agglutination tests and it is suggested that they may prove to be the carrier host. [The clinical characteristics of the disease in man, the non-pathogenicity to g. pigs, and the occurrence of agglutinins in local dogs all point to *L. canicola* infection.] —U. F. RICHARDSON.

STILES, W. W., & SAWYER, W. A. (1942). **Leptospiral Infections (Weil's Disease) as an Occupational Hazard.**—*J. Amer. med. Ass.* **118.** 34–38. **2848**

A discussion on the incidence of leptospirosis in persons with occupations which involve contact with rats or dogs, or with moist materials and water which may be contaminated by the urine of these animals. Seventy-three apparently authentic cases occurring in North America are tabulated. It is stated that a reliable diagnosis of leptospirosis cannot be made solely on the basis of clinical findings, darkfield microscopy, or gross P.M. findings.

See also absts. **2985** (amoebiasis), **2899** (trypanosomiasis), **2957** (surra), **2896**, **2959** (ovine coccidiosis), **2960** (bovine coccidiosis), **2958** (antimalarials).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

DORONIN, N. N., & KINDYAKOV, V. I. (1940). Vyyavlenie vozmozhnostel primeneniya reaktsii pretsipitatsii pri yashchure. Predvaritel'noe soobshchenie. **[The Precipitation of Foot and Mouth Disease Virus. Preliminary Note].**—*Zh. Mikrobiol., Moscow.* No. 8. pp. 86–87. [German summary]. **2849**

Serum containing specific precipitins was obtained by intravenous injections on 13 consecutive days of rabbits with 0·2–2 ml. of purified F. & M. virus. The purification of virus was performed by the method of DUNIN & POPOVA (1937), according to which a saline solution of virulent fluid from g. pig vesicles was precipitated by nonspecific serum obtained by the inoculation of rabbits with fluid obtained from blisters artificially produced on g. pigs. The purified virus was free from foreign proteins and preserved its antigenic character.

The preparation of serum containing specific precipitins for different types of F. & M. virus is under investigation.—A. MOLDAWSKY.

RAY, J. D. (1943). **Pseudorabies (Aujeszky's Disease) in Suckling Pigs in the United States.**—*Vet. Med.* **38.** 178–179. **2850**

A description of a severe outbreak among 190 pigs 1-2 weeks of age. Details are given of the syndrome. —J. A. GRIFFITHS.

SHOPE, R. E. (1943). **The Swine Lungworm as a Reservoir and Intermediate Host for Swine Influenza Virus. III. Factors Influencing Transmission of the Virus and the Provocation of Influenza. IV. The Demonstration of Masked Swine Influenza Virus in Lungworm Larvae and Swine under Natural Conditions.**—*J. exp. Med.* **77.** 111–126 and 127–138. [For previous parts, see *V. B.* **12.** 87]. **2851**

III. Of 98 transmission experiments on lungworms as intermediate hosts of swine influenza virus, 216 swine being used, 50 were negative, 35 positive, and 13 partly positive and partly negative (*i.e.* some but not all the experimental pigs became infected). It is suggested that some of these failures were due to the use of lungworm larvae free from virus and also to the use of earthworms in which artificial infection with lungworms had not been successful. S., however, considers that the main cause of failure was not absence of virus, but the use of an inappropriate stimulus which failed to activate the "masked" virus. The provocative stimulus which appeared to be most successful in the activation of the "masked" virus was multiple intramuscular injection of *Haemophilus influenzae-suis*. A large number of other activating agents was tried, but most of them were unsuccessful. In some infections no stimulus was necessary, and in these cases S. considers that the immune response of the swine to lungworm infection was sufficient provocative stimulus. Season was found to influence the activation of "masked" virus to a marked degree. January, February, and April were the months when infections could most easily be set up, whilst in March and September to December, infection was less regularly set up. In May, June, July, and August, pigs were entirely refractory. In a single experiment, swine influenza virus was isolated in the vicinity of lungworms but not from neighbouring lung tissue in a pig which had received a provoking dose of *H. influenzae-suis*, but which had not developed clinical symptoms. This observation is taken to demonstrate the intimate association between lungworms and the virus. "Masked" virus was demonstrated in lungworm ova obtained from the respiratory tract and from the faeces of infected swine. "Masked" virus was also demonstrated in lungworm ova obtained from convalescent swine, which were no longer carrying the virus in their respiratory tracts. In discussing his results, S. admits that there are difficulties and obscurities which have to be cleared up, and that after three years' work it is not possible to predict the results of swine influenza transmission experiments. He regards, however, the presence of "masked" virus in lungworms and its transmission through them to pigs as established, and considers that most failures in transmission experiments are due to the application of an insufficient provocative stimulus. It will be noted that experimental infections were most easily set up in January, February, and April, whilst natural outbreaks occur most frequently in November and December. S. suggests that the explanation of this may be that swine under natural conditions develop a solid immunity during the early winter which precludes an April epizootic.

IV. Earthworms, shown to be infected with lungworm larvae, were collected from a number of Iowa farms and fed to swine in an attempt to demonstrate the presence of "masked" virus in the field. In only two out of 14 cases was swine influenza infection set

up in the experimental pigs. This may have been due to the absence of virus in the lungworm larvae carried by the earthworms used in the experiment. In an experiment using earthworms collected from a farm upon which swine influenza was of annual occurrence, in only one of five attempts was there failure to set up infection in pigs, and this failure was regarded as due to an inappropriate provocative stimulus, as earthworms collected in the same month gave a positive result in another experiment. Prolonged and varied attempts were made to provoke infection in three pigs removed from an Iowa farm during the inter-epizootic period and these were successful in two of the pigs, illness in the third pig being possibly due to contact with one of the others. This experiment proved the presence of "masked" swine influenza virus in pigs during the inter-epizootic period.

S. discusses these results from the point of view of epidemiology and suggests that the rapid spread of the disease in the field is due to the presence of "masked" virus in the pigs and not to its highly contagious nature. —T. E. GIBSON.

LOOSLI, C. G., ROBERTSON, O. H., & PUCK, T. T. (1943). **The Production of Experimental Influenza in Mice by Inhalation of Atmospheres Containing Influenza Virus Dispersed as Fine Droplets.**—*J. infect. Dis.* **72.** 142–153. **2852**

In 1927, despite experimental results to the contrary, JORDAN concluded that "transmission of infectious droplets would explain the observed features of influenza epidemiology, as well as, if not better than, any other hypothesis". The authors review recent experimental evidence confirming this view.

Mice were placed in wire cages in a glass chamber of 60 litres capacity. The PR8 strain of influenza A virus was used and a virus lung suspension was introduced into the chamber by means of a Graeser atomizer. There was a small electric fan in the chamber. The results of the experiments indicated that mice could be inoculated quantitatively with air-borne influenza virus. As little as 0·2–0·3 ml. of a 10^{-2} suspension of virus dispersed in the air of the chamber regularly caused infection and death of the mice. Even 15 sec. exposure caused pulmonary lesions in all mice and deaths in a few. An exposure of 2 min. produced a uniformly fatal outcome. Reduction of the virus concentration correspondingly reduced the morbidity and mortality rates in the mice. When the tidal air of the test mice was increased by introducing 20% CO_2 into the chamber (and thus increasing the intake of virus), the morbidity and mortality was increased.

Measurement of the minute volume of the virus tidal air was carried out and the actual dose of virus estimated. It has been shown that liquids dropped into the nose of animals flow directly into the lower respiratory tract, and as the authors expected, the dose of virus required to infect by inhalation was greater than that by intranasal inoculation.—JOHN FRANCIS.

LOOSLI, C. G., LEMON, H. M., ROBERTSON, O. H., & APPEL, E. (1943). **Experimental Air-Borne Influenza Infection. I. Influence of Humidity on Survival of Virus in Air.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 205–206. **2853**

Mice were exposed to influenza A virus sprayed into a room by means of an atomizer producing fine particles. The duration of infectivity of the air depended on the relative humidity. A high humidity (80–90%) resulted in inactivation of the virus within one hour, but at a level of 45–55% humidity, virus persisted for six hours and at 17–24%, for at least 24 hours. It is suggested that survival of virus in atmospheres of low humidity is probably due to rapid drying of infective particles.—R. E. GLOVER.

HENLE, W., & HENLE, G. (1943). **Interference of Inactive Virus with the Propagation of Virus of Influenza.**—*Science.* **98.** 87–89. **2854**

The concentration of influenza A and B viruses, respectively, in allantoic fluid, as determined by mouse inoculation, reaches its maximum 12 to 18 hours after inoculation and falls to a low level by about the third day, whereas the chick red-cell agglutinating titre remains at a high level. On subcultivation, fluids with a high virus content, irrespective of the concentration of virus used to inoculate the eggs, ultimately reach high levels, but the amount of virus harvested when material 3–4 days old is used, may be poor in spite of the use of a concentrated inoculum. It is suggested that the accumulation of inactive virus after prolonged incubation interferes with the propagation of active virus.

Suspensions of virus inactivated to an extent which rendered them innocuous for mice but still capable of infecting eggs, were rich in the "inhibiting" substance. Similar interference was observed when mice received partially inactivated virus by the intranasal route followed five hours later by active virus. It is suggested that the difficulty encountered in propagating some strains of influenza virus may depend in part on this interference phenomenon.—R. E. GLOVER.

MCCLELLAND, L., & HARE, R. (1941). **The Absorption of Influenza Virus by Red Cells and a New in Vitro Method of Measuring Antibodies for Influenza Virus.** —*Canad. publ. Hlth J.* **32.** 530–538. **2855**

Confirming the observation of HIRST [*V. B.* **12.** 379.] that chick red blood cells were agglutinated by the allantoic fluids of fertile hens' eggs infected with influenza viruses A and B, the authors describe a method of inhibition agglutination whereby the neutralizing properties of serum from convalescent patients could be determined. In the preliminary studies, the red blood cells of man and g. pigs were found to possess similar agglutinating properties to those of chick embryos, day-old chicks, and hens, while those of the rabbit, rat, mouse, horse, and sheep did not. Comparative tests by the authors' method and the mouse test, as employed by other workers in this field, were on the whole good, although there were certain discrepancies between the two tests. The neutralizing properties of convalescent ferret sera could be determined also by the inhibition aggln. method.—L. M. H.

STUART-HARRIS, C. H. (1943). **Observations on the Agglutination of Fowl Red Cells by Influenza Viruses.** —*Brit. J. exp. Path.* **24.** 33–40. **2856**

The agglutinating property for fowl red cells of material from chick embryos infected with influenza virus [see HIRST—*V. B.* **12.** 379.] was shown to be inhibited by sera from normal rabbits, ferrets, fowls and horses, but sera containing neutralizing antibodies to influenza virus A or B were inhibitory in much higher dilutions to the homologous than to the heterologous virus.

It was also found in the course of the observations that there were a number of factors influencing the inhibition titre. Considerable variations were encountered by using the same strain of virus in different egg fluids and by using different strains of the same virus, and although virus B gave varying serum inhibition titres when mixed with red cell suspensions from different fowls, these suspensions with virus A gave no variation in serum inhibition titre.—ANTHONY BUXTON.

TAYLOR, A. R., SHARP, D. G., BEARD, D., & BEARD, J. W. (1943). **Isolation and Properties of the**

Equine Encephalomyelitis Virus (Eastern Strain).—*J. infect. Dis.* **72.** 31–41. **2857**

An account is given of the procedure adopted for the purification of the Eastern strain. The virus was grown in chick embryos which were inoculated in batches of 10–24 at a time. Embryos became moribund in 16–20 hours after inoculation and the virus was then harvested by centrifugation of the ground embryos at low speed for 1 min. and then at full speed for 3–4 min. Suspensions were then prepared in Ringer's solution to a dilution of 20% and extraction in an ice chest at 2°–5°C. was allowed to proceed for about 72 hours, when gross material was removed by centrifugation. The resulting crude extract was filtered 2–3 times, the final filtrate centrifuged at 20,000 r.p.m., and Ringer's solution added to the resulting pellet of material. These pellets were readily soluble in saline solutions at pH 6·5–8·5 and the virus responded to the usual protein tests. Extensive experiments for comparing the activity of the different batches of virus were not undertaken, but studies were made in which purified material was titrated in mice and only one preparation out of 20 failed to kill. Investigation of the properties and constitution of the virus complex indicated that it was a lipo-nucleoprotein complex and sedimentation velocity studies showed the purified preparation to be of high homogeneity with respect to particle size, while calculations of the mol. wt. of the complex gave an approximate value of 152,000,000.—J. C. Buxton.

Rosenbusch, F. (1942). **Equine Encephalomyelitis in the Argentine in its Experimental Aspects.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 209–214. **2858**

R. refers briefly to the outbreak of E.E. which affected the equine population of the Argentine in 1919, producing a morbidity rate of 80%, and also to later outbreaks; he records a number of interesting observations upon the disease in that country. The disease occurs in the summer months. In the affected zones, the prevailing mosquitoes have been *Culex* spp., and areas in which *Aëdes* spp. are predominant have not been especially affected. During the epizootic of 1935–36 there was a more frequent occurrence of infantile paralysis amongst the rural population than at any other time.

On the basis of cross-immunity studies, it was possible to relate the Argentine virus to the Western strain of the U.S.A. virus, and since there is no interchange of horses between the western states of the U.S.A. and the Argentine, R. advances the theory that migrating birds may be the carriers; this view is supported by the fact that many of the migratory species are known to be capable of harbouring encephalitis virus and may even be susceptible to its effects. Small-scale experiments carried out by R. upon some species of wild birds, however, produced almost entirely negative results.

Successful vaccination experiments carried out upon horses are summarized in tables.—J. C. Buxton.

Savage, A. (1942). **Note on the Prevalence of Encephalomyelitis in Manitoba Horses Prior to 1941.**—*Canad. publ. Hlth J.* **33.** 258. **2859**

E.E. appears to have been first noted in Manitoba in 1932. It occurred in epidemic form in 1937; 9% of the horse population were obviously affected, with a mortality rate of 27%, in ten municipalities in which a questionnaire was circulated. In the north central portion of the Province, there were 1,445 cases with a mortality rate of 39%. There was another outbreak in 1938 in which figures on the incidence were not obtained. Infection was on the wane in 1939, and in the two subsequent years cases were widely distributed but did not occur in notable numbers in any area. It is suggested that the extensive exposure of the horse population and the widespread vaccination of horses may have been connected in some way with the appearance of the disease in human beings in 1941. Prior to the introduction of formolized chick-embryo vaccine for horses, no extensive outbreak in human beings seems to have been recorded.—R. Gwatkin.

I. Gareau, U. (1941). **Clinical Aspects of an Epidemic of Human Encephalomyelitis in Saskatchewan in 1938.**—*Canad. publ. Hlth J.* **32.** 1–5. **2860**

II. Fulton, J. S. (1941). **Relation of Equine Encephalomyelitis to the Epidemic of Human Encephalitis in Saskatchewan in 1938.**—*Ibid.* 6–12. **2861**

III. Mitchell, C. A. (1941). **The Public Health Problem of Equine Encephalomyelitis.**—*Ibid.* 37–38. **2862**

I. Twenty human cases were diagnosed. The disease was not confined to any age or sex group. The seasonal occurrence in man is similar to that in horses.

II. F. records the loss of some 15,000 horses from the disease. Chick-embryo inoculation is the best method for isolating the virus. A higher concentration of virus was found in the medulla than in other parts of infected horse brains. Filtration greatly reduces the virus content of infected material. Although the disease occurs during the fly season and has been experimentally transmitted by flies, F. could gather no direct evidence to associate the spread of the disease with flies. Susceptibility bore no relation to age, sex, or breed and the seasonal appearance of cases, together with the irregular distribution, indicated that the infection was acquired from a common source rather than being transmitted from animal to animal. A programme of inoculation with chick-embryo vaccine was initiated and about half the horse population of the Province was so dealt with. The methods employed for serum-neutralization tests in chick embryos and in g. pigs are given.

III. M. points out that man is susceptible to both the Eastern and Western types of E.E. virus and that the former type causes a much higher mortality. The questions are raised of the existence of a reservoir of the virus and whether or not man is infected from horses. The epidemiology of the disease is perhaps not as important now that a satisfactory immunizing agent in the form of chick-embryo vaccines is available. Nevertheless, the elucidation of many factors concerned with its epidemiology will undoubtedly shed light on other neurotropic virus diseases.—L. M. Heath.

Howitt, B. F. (1942). **The Virus of Equine Encephalomyelitis and its Relationship to Human Infection in California in 1937-1938.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 235–245. **2863**

During investigations into outbreaks of encephalitis occurring in human beings in California in 1937–38, it was found by neutralization tests that in the northern and central parts of the state, the St. Louis virus was more prevalent, by a small margin, than the Western equine virus. No definite relationship was noted between cases of E.E. in horses and those in man; H. suggested that mosquitoes may be vectors of E.E. —J. C. Buxton.

Riley, W. A. (1941). **Encephalitis in Minnesota.** —*Minn. Med.* **24.** 666 & 706. **2864**

Five of the ten species of mosquitoes shown experimentally to be capable of transmitting equine encephalomyelitis virus, are present sporadically and in varying numbers in Minnesota. They are *Aëdes vexans*, *A. triseriatus*, *A. nigromaculis*, *A. dorsalis*, and *A. atropalpus*.

Of these, only the first occurs in numbers large enough to make it important as a possible vector of infection.

CASALS, J., CURNEN, E. C., & THOMAS, L. (1943). **Venezuelan Equine Encephalomyelitis in Man.**—*J. exp. Med.* **77.** 521–530. **2865**

An account of two cases of Venezuelan E.E. which occurred in laboratory assistants and ran a short and mild course. Identification of the virus was accomplished by means of neutralization and mouse inoculation tests. These observations are the first to indicate the possibility of human infection with the Venezuelan virus.—J. C. BUXTON.

WYCKOFF, R. W. G. (1942). **Encephalomyelitis Viruses and Vaccines.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 247–250. **2866**

The encephalitis viruses differ from several others in their ability to infect several tissues of a single host and it is this lack of tissue specificity which accounts for the diphasic character of infection with the virus of equine encephalomyelitis. Vaccines made from the growth of virus on the chorio-allantoic membranes of hen's eggs were used extensively in the epidemic of 1938. The optimum storage temperature of an embryo vaccine is 40°F. and two doses of 0·5 ml. of vaccine administered a week apart confer the best protection. —J. C. BUXTON.

GRUNDMANN, A. W., KITSELMAN, C. M., RODERICK, L. M., & SMITH, R. C. (1943). **Studies on the Transmission of the Western Strain Virus of Equine Encephalomyelitis by the American Dog Tick, *Dermacentor variabilis* Say and by *Triatoma sanguisuga* (LeConte).**—*J. infect. Dis.* **72.** 163–171. **2867**

Several specimens of *D. variabilis* and the two succeeding generations of their offspring, allowed to complete their life-cycle in association with g. pigs, rabbits, and horses which had been infected with the Western strain of E.E., did not become infected. Adult ticks which had been artificially inoculated were unable to transmit infection and their progeny contained no virus.

The authors were able to infect *T. sanguisuga* by feeding it on infected g. pigs, and by this means to transmit the virus to susceptible g. pigs, but all attempts to infect a horse by this method were unsuccessful. —J. C. BUXTON.

SWINE FEVER.—*See abst.* **2887**.

SCHNELLE, G. B. (1943). **The Nomenclature of So-Called Infectious Enteritis of Cats.**—*J. Amer. vet. med. Ass.* **102.** 371–372. **2868**

A plea that indefinite terms such as "feline enteritis" and "feline distemper" should not be used to describe that specific virus disease of cats which, because of its characteristic blood picture, may accurately be called "panleucopenia".—E. COTCHIN.

KIKUTH, W., GÖNNERT, R., & SCHWEICKERT, M. (1940). Infektiöse Aleukozytose der Katzen. [**Infectious Aleucocytosis in Cats**].—*Zbl. Bakt. I. (Orig.).* **146.** 1–17. **2869**

This is a detailed description of a contagious disease of laboratory cats which caused heavy losses in the winter of 1936–37 at Wuppertal-Elberfeld.

Affected cats refused food and water, occasionally vomited, and died suddenly after a very few days. The striking clinical finding was a rapidly progressive fall in the leucocyte count from the usual normal level of 15,000–30,000 to below 1,000 per cu.mm. There was slight fever giving place to subnormal temperature shortly before death. The natural incubation period seemed to be about 12 days and the mortality rate was over 60%. Nearly every cat in the colony became affected, but a few resisted completely and these also resisted attempts to infect them experimentally with diseased tissue suspension. Such cats were found to possess serum having high prophylactic and curative properties.

The only constant P.M. finding was inflammation of the small intestine and hypoplasia of the haemopoietic organs. Acidophilic cell inclusions (depicted in plates) were to be seen in cells of the intestine, spleen, bone marrow, adrenals, and lymph follicles and were of the type usual in virus infections. Attempts to isolate a filtrable virus and to transmit it to laboratory animals yielded inconclusive results.

The disease is distinct from feline distemper, feline gastro-enteritis, and laryngo-enteritis, but is evidently identical with the disease described by HAMMON & ENDERS in 1939 [*V. B.* **9.** 625].—J. E.

HEATH, L. M. (1942). **Distemper Studies in Ferrets. I. Attempted Conversion of a Virus Strain from Viscerotropic to a Neurotropic Form.**—*Canad. J. comp. Med.* **6.** 125–129. **2870**

WATSON, E. A., & HEATH, L. M. (1942). **Distemper Studies in Ferrets. II. Tissue Vaccines Prepared from Viscerotropic Distemper Virus.**—*Ibid.* 176–181. **2871**

HEATH, L. M., & WATSON, E. A. (1942). **Distemper Studies in Ferrets. III. Tissue Vaccines Prepared from Neurotropic Distemper Virus.**—*Ibid.* 204–207. **2872**

WATSON, E. A., & HEATH, L. M. (1942). **Distemper Studies in Ferrets. IV. Protective, Therapeutic and Aggressin Properties of Composite Tissue Vaccine.**—*Ibid.* 234–238. **2873**

HEATH, L. M., WATSON, E. A., & PLUMMER, P. J. G. (1942). **Distemper Studies in Ferrets. V. Immunizing and Therapeutic Properties of Anti-distemper Serum.**—*Ibid.* 262–267. **2874**

WATSON, E. A., HEATH, L. M., & PLUMMER, P. J. G. (1942). **Distemper Studies in Ferrets. VI. Attempted Control of a Distemper Epidemic in a Ferret Colony with Tissue Vaccines and with Antiserum.**—*Ibid.* 324–331. **2875**

I. Ten serial intracerebral passages through ferrets of a fixed viscerotropic distemper virus resulted in the manifestation of purely neural symptoms in six of the passages, while in the other four passages, visceral symptoms preceded the manifestation of neural symptoms. Parallel serial subcutaneous inoculations resulted in neural symptoms in only three of the ten passages and these were preceded by visceral symptoms. In the other seven passages, the symptoms were purely visceral. There is no basis for assuming that, when neural symptoms were manifested, the virus was changed from a viscerotropic to a neurotropic form.

For comparison, inoculations were similarly made with a neurotropic virus. In all ten serial intracerebral passages through ferrets with this virus, purely neural symptoms were manifested, while in nine of the ten parallel subcutaneous passages which could be assessed (in one passage the ferret died suddenly without symptoms being observed), purely neural symptoms were manifested in five passages, neural preceded by visceral symptoms in three, and neural followed by visceral symptoms occurred in one.

II. When experimental animals were exposed by direct inoculation or by contact to distemper infection, a composite suspension of formolized tissue, exclusive of brain or spleen, appeared to possess superior immunizing properties to a comparable suspension of spleen tissue only. Under similar test conditions, individual tissues in comparable formolized suspensions appeared to possess varying degrees of immunizing properties.

The suspensions, in all instances, were prepared from tissues collected from animals manifesting visceral symptoms of distemper. There was evidence to indicate that exposure by contact was a more severe test of the immunizing properties of some of the suspensions than subcutaneous inoculation of virus.

III. Two vaccines, containing a neurotropic virus and prepared from mixed tissues and brain tissue respectively, established immunity in ferrets against homologous and heterologous virus strains given by the subcutaneous route. No protection, however, was afforded animals treated with brain-tissue vaccine and inoculated intracerebrally with homologous virus, while half of those treated with mixed-tissue vaccine and inoculated in the same manner were protected.

IV. After the use of vaccine composed of formolized tissues of virus-infected ferrets immunity against infection was established in a minimum period of five days for subcutaneous inoculation of virus and of eight days for cohabitation with infected animals. Tissue vaccine administered after infection had no therapeutic value or effect on the course of the disease, neither could it be shown to possess any aggressin properties.

V. Distemper antiserum protected ferrets when administered in appropriate doses, simultaneously or as late as three days after the subcutaneous inoculation of distemper virus. On the other hand, ferrets developed distemper symptoms when serum-treated on the same day or at intervals up to ten days before, or four days after, contact with ferrets manifesting visible symptoms. One ferret, however, serum-treated two days after similar exposure, recovered and became immune. All other animals died of distemper. The administration of antiserum to ferrets after the appearance of visible symptoms had no effect on the course of the disease.

VI. In a natural outbreak of distemper in a ferret colony, tissues vaccines prepared from ferret and from fox tissues and distemper antiserum, prepared from foxes, were employed comparatively, on the fifth and seventh days after the first observed case. The vaccines and antiserum were used individually and in combination and were applied on the fifth day to 226 ferrets and on the seventh day to 187 ferrets. The vaccines applied on the fifth and seventh days gave an average protection of 61·3% and 15·3% respectively, while antiserum applied at the same periods gave an average protection of 16% and 66·6%. Protection given by vaccines prepared from ferret tissues varied from 72–84% on the fifth day and apparently was related to the age of the vaccines, while protection given by vaccine prepared from fox tissue was only 12%. The simultaneous application of vaccine and distemper antiserum gave less protection than either agent applied individually, at corresponding periods after the beginning of the outbreak.

433 young ferrets, all but three of which became infected, and 100 adult ferrets, all of which became infected, were used as controls. The presence of inclusion bodies as a criterion of infection was found unreliable.—L. M. Heath.

Karr, H. V. (1943). **Study of a Latent Pneumotropic Virus of Mice.**—*J. infect. Dis.* **72.** 108–116. **2876**

Virus infections involving the respiratory tracts of mice have been encountered by a number of investigators, and this paper describes work carried out with "a latent agent of pneumonia in mice isolated on intranasal passage of mouse lungs". Mice inoculated intranasally with unfiltered suspensions of infected mouse lungs died within 72 hours and showed typical pneumonic lung lesions. It was not possible to maintain the virus in serial passage by either intracerebral or intraperitoneal inoculation; nor could the virus be transmitted from mouse to mouse by ordinary contact, but evidence of infection was produced after the ingestion by mice of infected material. The virus did not induce the appearance of neutralizing serum when injected into a rabbit.—J. C. Buxton.

Burnet, F. M. (1942). **Psittacosis in Australia.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 349–352. **2877**

Psittacosis is known to be prevalent among all the common breeds of Australian parrots and cockatoos, and enlargement of the spleen is often the only visible pathological sign. It is probable that young birds become mildly infected whilst in the nest and lose all sign of the disease by the time they have learned to fly. As far as B. is aware, only one human death has been proved to be due to psittacosis in Australia and not many cases of the disease in human beings have been reported in the Commonwealth. The amount of infection in budgerigar aviaries is problematical, since the only birds which have been examined are those which have been definitely incriminated in cases of human infection.—J. C. Buxton.

Zuccarini, J. A., & Molinelli, E. A. (1942). **Psittacosis in the Argentine Republic.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 345–347. **2878**

An account is given of cases of psittacosis encountered in human beings in various parts of the Argentine, many of which were traced to direct infection from members of the parrot family.

Psittacosis virus was isolated from a number of budgerigars purchased from birdsellers in Buenos Aires City.—J. C. Buxton.

Trask, J. D., Paul, J. R., & Melnick, J. L. [With the assistance of Riordan, J. T., & Bishop, M.] (1943). **The Detection of Poliomyelitis Virus in Flies Collected during Epidemics of Poliomyelitis. I. Methods, Results, and Types of Flies Involved.**—*J. exp. Med.* **77.** 531–544. **2879**

Trask, J. D., & Paul, J. R. (1943). **The Detection of Poliomyelitis Virus in Flies Collected during Epidemics of Poliomyelitis. II. Clinical Circumstances under Which Flies Were Collected.**—*Ibid.* 545–556. **2880**

The first paper deals with the technique employed for the demonstration of poliomyelitis virus in different types of flies and the second with the clinical and epidemiological circumstances under which positive results were obtained.

Biting and non-biting insects were trapped and killed either by exposure to low temperatures or by means of an ether spray and their bodies suspended or emulsified in distilled water. Intranasal and intra-abdominal inoculations were made into monkeys and daily records of their reactions were kept over a period of four or five weeks. If any animal showed signs suggestive of experimental poliomyelitis, it was killed and histological sections from different parts of the spinal cord were examined. An attempt was made on each of these occasions to transfer the virus to further monkeys by numerous intracerebral inoculations. In this way, 39 tests carried out upon 19 different samples of flies yielded definitely positive results in four instances, with one result classed as doubtful. A series of comparative tests to indicate the disease-carrying powers of biting and non-biting insects yielded inconclusive results.

The samples of flies used in the above experiments were collected in areas where epidemics of poliomyelitis were known to be in existence and under circumstances which gave good opportunities for the collection of infected flies.—J. C. Buxton.

Philip, C. B., & Smadel, J. E. (1943). **Transmission**

of West Nile Virus by Infected *Aëdes albopictus*.—*Proc. Soc. exp. Biol., N.Y.* **53.** 49–50. **2881**

Hamsters were infected with virus [see SMITHBURN *et al.*—*V. B.* **13.** 53.] and anaesthetized and 24 hours later a number of *A. albopictus* mosquitoes was permitted to feed upon them. The mosquitoes were killed and their bodies triturated in 2 ml. of saline solution plus 2% normal g. pig serum. The solution was centrifuged and injected into a number of mice, all of which died in 5–8 days. Brain suspensions from these mice were infective for other mice when injected intracerebrally. An antigen was prepared from mouse brains of the fourth passage which fixed complement with specific antibodies from the serum of a hamster which was hyperimmune to West Nile virus.—J. C. B.

FOX, J. P. (1943). **Non-Fatal Infection of Mice Following Intracerebral Inoculation of Yellow Fever Virus.**—*J. exp. Med.* **77.** 507–520. **2882**

The observations reported were made in large part on mice inoculated with virus of the various 17D substrains, which have been used as routine in Brazil in the preparation of yellow fever vaccine and are of low virulence. Recoveries from clinical infection and entirely inapparent infections were observed. The recurrence of non-fatal infections was related to the dose of virus used and in less extensive studies it was shown that the ability of different strains of virus to produce inapparent infections varied considerably. Unmodified strains isolated from Brazilian cases of jungle yellow fever produced a high percentage of non-fatal infections, whereas they were rare when virulent laboratory strains were used.—JOHN FRANCIS.

DREW, W. R. M., SAMUEL, E., & BALL, M. (1943). **Primary Atypical Pneumonia.**—*Lancet.* **244.** 761–765. **2883**

An account is given of the clinical features of primary atypical pneumonia in man, based on an examination of 50 patients. The disease, which clinically may be confused with influenza pneumonia and allied conditions, is characterized by an absence of physical signs of lung involvement, although radiological examination reveals lesions of varying extent. It usually runs a benign course ending in complete resolution.

Some cases are undoubtedly due to infection with viruses of the psittacosis group, but the aetiology of the majority is, as yet, unknown. It is pointed out that the resemblance of the lung lesions to those induced by certain viruses and by rickettsia suggests a similar aetiology.

The course of the disease was unaffected by chemotherapeutic measures.—R. E. GLOVER.

BLAKE, F. G., HOWARD, M. E., & TATLOCK, H. (1943). **Feline Virus Pneumonia and its Possible Relation to Some Cases of Primary Atypical Pneumonia in Man.**—*Yale J. Biol. Med.* **15.** 139–166. **2884**

An investigation was made into three human cases resembling primary atypical pneumonia on a farm where a number of cats had died from a respiratory disease. Sputum from one of the human patients, inoculated intratracheally and intranasally into cats, produced fever, lachrymation etc., but it proved impossible to obtain serial passes. The cats on the infected premises suffered from an acute respiratory disease characterized by a muco-purulent conjunctivitis, rhinitis, sneezing and coughing: at autopsy, the chief change was a moderate to extensive focal pneumonia. Suspensions of affected lung induced a pneumotropic virus disease in adult cats, but the experimental animals were only moderately responsive: kittens, on the other hand, were highly susceptible to an intranasal instillation of the virus which was transmitted through several generations and proved infective in dilutions of lung and spleen (mixed) up to 10^{-4}. The microscopic pathology of the lungs was consistent with a pneumonitis of virus aetiology.

"There is conspicuous edema of the perivascular "and peribronchial interstitial tissue with sparse large "mononuclear cell infiltration; the bronchi and "bronchioles show beginning necrosis of the epithelial "cells with some desquamation; their lumina contain "a serous exudate with variable numbers of large and "small mononuclear cells and occasional polymorpho-"nuclear leukocytes; in focal peribronchiolar areas the "alveoli show variable degrees of atelectasis, their walls "are thickened, the alveolar lining cells show signs of "necrosis, and the alveolar spaces are filled with a "serous exudate containing variable numbers of cells, "conspicuously and predominantly large mononuclear "in character, though some small mononuclear and "sparse polymorphonuclear leukocytes are present; "there is little or no fibrin, no hemorrhage, and the "pleural surface shows no exudate."

All attempts to transmit infection to mice failed. A discussion on the relation of this virus to known infections of the cat is given.—R. E. GLOVER.

*MARCONI, R. (1942). Virus-proteine e formalina. Rassegna sintetica. [**The Effect of Formalin on Virus Proteins**].—*Arch. ital. Med. sper.* **10.** 163–172. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 416]. **2885**

M. reviews the effect of formalin on plant and animal viruses and on bacteriophage, and the reversibility of the resulting inactivation. No conclusions are drawn.—J. G. CARR.

BIRCH, F. M., & LUCAS, A. M. (1942). **Effects of Centrifugation on Intranuclear Inclusions Produced by Subcutaneous Injections of Aluminum Oxide.**—*Amer. J. Path.* **18.** 1051–1059. **2886**

Subcutaneous injection of aluminium oxide (0·75%) in saline produces nodules at the site of inoculation which on histological examination show intranuclear inclusions resembling those seen in some virus diseases. The authors have studied the method of formation of these inclusions and their behaviour when the freshly excised nodule is spun on an ultracentrifuge (up to 3,400 rev. per sec.). Centrifugation showed that basichromatin is the heaviest nuclear component and comes to occupy the centrifugal pole: the lighter inclusions take up a position quite near and the nuclear sap is shown to be the lightest cell constituent. The mode of formation of the artificially induced inclusions and their behaviour on centrifugation suggest that, like the inclusions seen in submaxillary gland disease of the g. pig and in fox encephalitis, they are composed mainly of oxychromatin.—E. G. WHITE.

COLES, J. D. W. A. (1941). **A Rickettsia-like Organism of the Conjunctival Epithelium of Pigs.**—*Arch. Ophthal.* **25.** 101–112. **2887**

Investigations into the occurrence of conjunctivitis in swine in the U.S.A. suggested that the disease is limited to acute or subacute conjunctivitis of one or both eyes, the cornea being rarely, if ever, inflamed. In the early stages of the disease numerous inclusion bodies and neutrophile cells are encountered in conjunctival smears. Later, the inclusion bodies decrease in number, and the neutrophile cells are replaced by lymphocytes and monocytes. The inclusions vary in number from 1–10 in a cell and are composed of very pleomorphic granules, without the sharp distinction between initial and elementary bodies described in other rickettsial infections. The granules are Gram-

negative and non-acid-fast; they stain well with Giemsa, but poorly with other dyes. They appear to multiply only in cytoplasm. It is suggested that the conjunctival inclusions described by UHLENHUTH and others as being associated with swine fever, were probably inclusions due to this infection, and are rickettsia-like organisms not connected in any way with the virus of swine fever.—U. F. RICHARDSON.

STEINHAUS, E. A. (1942). **Rickettsia-like Organism from Normal** *Dermacentor andersoni* **Stiles.**—*Publ. Hlth Rep., Wash.* **57.** 1375–1377. **2888**

A rickettsia-like organism, isolated from a laboratory strain of *D. andersoni*, is described. Bites of the ticks had never caused fever in small laboratory animals on which they had been fed. Cultivation of the organism on artificial media failed, but it was successfully passaged in chick embryos. Intraperitoneal injections of tissues and eggs of the ticks were not infective for g. pigs, nor was there any evidence of infection when infected chick-embryo fluids, often in massive doses, were injected into g. pigs, rabbits, white mice, a monkey, rats, and squirrels, the two last being natural hosts of *D. andersoni*. The g. pigs and rabbits used showed no immunity later to Rocky Mountain spotted fever nor to American "Q" fever.

PLOTZ, H., SMADEL, J. E., ANDERSON, T. F., & CHAMBERS, L. A. (1943). **Morphological Structure of Rickettsiae.**—*J. exp. Med.* **77.** 355–358. **2889**

Studies made by means of the electron microscope on the rickettsia of epidemic and endemic typhus fever, Rocky Mountain spotted fever, and "Q" fever, from egg yolk-sac cultures, revealed that they have a limiting membrane surrounding a substance which appears to be protoplasmic in nature, and contains a number of dense granules. It is considered that in this respect they resemble certain bacteria and the elementary bodies of vaccinia virus, but it is pointed out that the great variation in the rickettsial bodies of the same strain contrasts with the relatively high degree of uniformity in structure observed in viruses. Particular attention was paid to the large bacillary forms of rickettsia, but smaller coccoidal forms, which could not be differentiated from tissue particles by the ordinary microscope, were also easily recognized by the electron microscope. Small and medium-sized dense granules without surrounding substance or membranes were also encountered in rickettsial preparations. It is suggested that these may represent portions of disintegrated rickettsia.

—U. F. RICHARDSON.

See also absts. **2892** (neurotropic virus immunity), **2900** (vectors of viruses).

IMMUNITY

GROSS, H., & HENNIG, G. (1942). Der Gebrauch von konserviertem Komplement in der Serodiagnostik. **[Preserved Complement in Serological Diagnosis].**—*Klin. Wschr.* **21.** 136–137. [Abst. in *Bull. Hyg., Lond.* **17.** 493, copied *verbatim*. Signed: H. H. S.] **2890**

Guineapig complement under ordinary conditions undergoes marked reduction in titre in a couple of days. Attempts have, therefore, been made from time to time to preserve complement without loss of titre, such as freezing (MORGENROTH), addition of hypertonic saline (FRIEDBERGER), addition of 10 per cent. sodium acetate in a proportion of six to four (RHAMY, HAMMERSCHMIDT and SCIMONE), addition of 10 per cent. saline and 4 per cent. boric acid (GINSBURG and KALININ) among others. RUFFNER re-tested several methods, notably 8 per cent. saline; 10 per cent. saline *plus* 4 per cent. boric acid; 10 per cent. sodium acetate *plus* 4 per cent. boric acid; glycerine, thymol, strontium chloride and boric acid, chinosol, rivanol, sodium citrate and freezing. He found the third of these—sodium acetate and boric acid—the best, with saline and boric acid a close second. When the serum was kept in the ice-chest the complement titre was maintained for three weeks. SONNENSTEIN found it to undergo little, if any, reduction even in five weeks, and SEELEMANN stated that it could be used as long as three and a half months afterwards. The authors of this note sum up their own researches by saying that "the addition of 10 per cent. sodium acetate and 4 per cent. boric acid to freshly obtained and undiluted guineapig serum is a simple and useful method and one to be recommended for preservation of complement".

VAĬNTRAUB, A. M. (1940). Sravnitel'nyĭ analiz sorbtsionnovo mekhanizma spetsificheskovo i nespetsificheskovo svyazyvaniya agglyutininov bakteriyami. **[Absorption Mechanism of Specific and Nonspecific Bacterial Agglutination].**—*Zh. Mikrobiol., Moscow.* No. 8. pp. 12–19. [German summary]. **2891**

The author studied the relationship to temperature of agglutinin absorption from *Salmonella paratyphi* B antiserum by killed *S. paratyphi* B and *S. typhi* suspensions.

Specific absorption of the agglutinins from the antiserum by *S. paratyphi* B occurred in accordance with the equation formula of Freundlich's isotherm, the degree of interaction between the specific flagellar and somatic antigens and the corresponding agglutinins decreasing with rise in temperature.

In the nonspecific absorption of agglutinins from the *S. paratyphi* B antiserum by *S. typhi*, the relation between the absorbed and residual agglutinins remained constant, the degree of interaction between the nonspecific fraction of the *S. typhi* somatic antigen, possessed also by *S. paratyphi* B, and the corresponding nonspecific agglutinins in the *S. paratyphi* B antiserum being unaffected by rise in temperature.

In V.'s opinion, this difference in response to rise in temperature justified the view that true absorption does not occur in nonspecific agglutination and that fixation of nonspecific agglutinins by heterologous bacteria takes place by simple distribution.

FOX, J. P. (1943). **Immunity to Yellow Fever Encephalitis of Monkeys and Mice Immunized by Neural and Extraneural Routes.**—*J. exp. Med.* **77.** 487–506. **2892**

Literature is quoted supporting the general conclusions that a developing systemic immunity, evidenced by the presence of considerable quantities of specific antibodies in the serum, may not prevent an established neural infection from continuing to a fatal conclusion, while a pre-existing systemic immunity not only fails to confer uniform protection to more than small doses of neurally inoculated virus, but may also fail at times to protect against virus inoculated by extraneural routes.

Experiments with monkeys and mice showed that animals surviving cerebral infection with relatively virulent strains of yellow fever virus were resistant to maximal intracerebral doses of highly neurotropic yellow fever virus. On the other hand, animals immunized by extraneural routes show only irregular resistance to intracerebral inoculation of virus even when possessing serum antibody titres several times higher than those

of intracerebrally immunized mice. It was shown, however, that the protective activity of brain suspension from mice surviving cerebral infection was several times higher than that of animals surviving a systemic infection.

F. concludes that the superior resistance of the intracerebrally immunized mice is due to a specific local mechanism which is due at least in part to an increased concentration of antibody in the cerebral tissue.—JOHN FRANCIS.

LURIE, M. B., & ZAPPASODI, P. (1942). **Effect of Chorionic Gonadotropin on the Spread of Particulate Substances in the Skin of Rabbits.**—*Arch. Path.* **34.** 151–166. **2893**

Studies on rabbits which had been given an intravenous injection of 0·1 mg. of a purified gonadotropic (luteinizing) extract of human pregnancy urine 48 hours before receiving an intradermal injection of India ink, indicated that the hormone treatment considerably enhanced the spread of the injected material, particularly in females. The authors suggest that this effect is due, in females, to progesterone released from corpora lutea produced by the gonadotropic extract and, in males, to testosterone derived from extract-stimulated testicular interstitial cells.

These results are discussed [in conjunction with LURIE's finding (*V. B.* **10.** 438—II.) that the susceptibility of rabbits to generalized TB. was paralleled by the degree of spread of particulate matter injected into their skins] from the standpoint of the possible role of the corresponding anterior pituitary gonadotropic hormone in human resistance to TB., particularly at puberty.—J. LOCHIEL MCGIRR.

MCCLEAN, D. (1942). **The in-vivo Decapsulation of Streptococci by Hyaluronidase.**—*J. Path. Bact.* **54.** 284–286. **2894**

Experiments in mice designed to show the influence of hyaluronidase on infection by highly virulent capsulated strains of both group A and group C streptococci showed that doses of the enzyme far in excess of those required to decapsulate completely the organisms *in vitro* failed to do so *in vivo* and that injection of the enzyme had no effect on the death rate or survival time. These results did not confirm those reported by HIRST [*V. B.* **12.** 194.], although his experiments were repeated in every particular except that testicular hyaluronidase was used instead of leech extract.

Observations were made on the quantity of enzyme necessary to decapsulate streptococci in the peritoneum of a mouse and the length of time the decapsulated state exists. It was found that even 100 viscosity-reducing units (V.R.U.) of enzyme maintained complete decapsulation for only about 1½ hours while similar *in vitro* experiments showed that 0·5 V.R.U. was sufficient to decapsulate the organisms completely and to maintain decapsulation throughout the incubation period. This striking difference between the *in vivo* and *in vitro* activity of the enzyme suggests that there is some factor which inhibits the enzyme in the living body. It was found that 0·2 ml. of heparinized whole mouse blood suppressed the *in vitro* decapsulating activity of 10 V.R.U. of enzyme. Further investigations showed that the inhibiting factor was in the serum and not in the red blood cells or leucocytes and that it is associated with the pseudo-globulin fraction.—R. ALLCROFT.

See also absts. **2805** (immunity to TB.), **2824** (clostridium toxins), **2854–2856** (inhibition agglutination and influenza), **2870–2875** (distemper immunization), **2823** (Shwartzman phenomenon), **2989–2996** (protein chemistry).

PARASITES IN RELATION TO DISEASE [GENERAL]

PATIÑO-CAMARGO, L. (1942). **Helminthiasis and Protozoiasis in Colombia.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 527–547. **2895**

The article describes the parasitic infestations of man, and lists the parasites of the domestic animals, in Colombia. The "milk" or latex of certain trees of the genera *Ficus* and *Calactodendrum* is stated to be a good, non-toxic anthelmintic. Diagnosis of amoebiasis in man has been made from the radiological picture of the intestines when clinical and microscopic methods have failed.—T. E. GIBSON.

HAMMOND, D. M., & HAMILTON, G. A. (1941). **The Incidence of Coccidia and Intestinal Nematodes in Sheep at the Utah State Agricultural College and Vicinity of Logan.**—*Proc. Utah Acad. Sci.* **18.** 69–71. **2896**

Coccidia were found in the faeces of all of 67 sheep examined. Species incidence as determined by the examination of unsporulated oocysts was similar in general to that found by CHRISTENSEN [*V. B.* **9.** 696.] in sheep from various other states.

Sheep at the college kept in clean pens and fed from racks throughout the year were found to have a significantly lower rate of infestation with intestinal nematodes than had Karakul sheep kept in pastures or small enclosures and fed on the ground.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

LINDQUIST, A. W. (1942). **Ants as Predators of *Cochliomyia americana* C. & P.**—*J. econ. Ent.* **35.** 850–852. **2897**

Experiments are described which indicate that ants are important predators of third-stage larvae of *C. americana* in the carcasses of animals which have died from screwworm infestation. In carcasses unprotected against ants, only 4·1% of the larvae of *C. americana* gave rise to flies, whereas when carcasses were protected from ants, 93·1% of the larvae produced flies. Larvae which mature on the living host and then drop off are probably not preyed upon to the same extent, for experiments in which mature larvae were dropped on the ground showed that 19·8% of such larvae produced flies; of similarly placed larvae in screen-topped jars, 70–100% emerged. At least seven species of ants were recorded from carcasses, the main predators being *Eciton* (*Labidus*) *coecum* and *Pheiodole* spp.—J. B. C.

BRODY, A. L., & KNIPLING, E. F. (1943). **Can Larvae of *Cochliomyia americana* C. and P. Mature in Carcasses?**—*J. Parasit.* **29.** 59–60. **2898**

According to the authors, it is unlikely that larvae of *C. americana* which are 24–48 hours old on the death of the host, will be able to complete development in a carcass left exposed under natural conditions and therefore open to colonization by other carrion feeders. Where carcasses were protected from attack by other insects, 24-hour-old larvae did mature and produce flies; but younger larvae (15–20 hours) died in the five trials in which they were used.—J. B. CRAGG.

LEWIS, E. A. (1941). **Interim Report on Experiments to control Glossina pallidipes in the Lambwe Valley, South Kavirondo, Kenya Colony.** pp. 12. Kabete. [Mimeographed] [fcp]. **2899**

The system adopted for the control of *G. pallidipes*

in the Lambwe Valley has been by trapping, hand-catching by screened fly catchers, and the creation of barrier clearings to protect areas under action from reinfestation.

Clearings to be effective should be about 1,000 yards wide; thinning of thickets adjoining the cleared area compels the flies to abandon the marginal bush, and thus reduces their tendency to cross the open space. Trapping proved advantageous when the fly population was large, but it is extremely doubtful whether it will effect the extermination of residual small numbers. Of the traps in use, the Harris trap proved the most efficient, but its cost in material, labour, and transport is considered prohibitive. The Langridge collapsible trap gave good results, but the wide mouth permitted flies to escape. It is thought that this defect can be remedied. These traps cost only about half as much as Harris traps, and can be easily transported. The siting of traps has an important bearing on their efficiency; small glades, more or less enclosed by thicket, or the margin of dense bush, were found to be the most profitable natural sites. To eliminate the remainder of the flies after trapping had reduced the density, hand-catching by boys with hessian screens was used successfully. It is a slow process, but it is suggested that it might be accelerated by opening the thicketed bush frequented by the flies for breeding purposes.

Some of the freed areas have been successfully re-settled and re-stocked.—U. F. RICHARDSON.

PARKER, R. R. (1942). *Ornithodorus* **Ticks as a Medium for the Transportation of Disease Agents.**—*Publ. Hlth Rep., Wash.* **57.** 1963–1966. **2900**

The harbouring in the tissues of *Ornithodorus* ticks of disease-producing agents, of which the ticks are not known to be transmitters, is discussed. It is pointed out that, except in the case of *O. parkeri* which harbours the rickettsia of Rocky Mountain spotted fever and transmits it by the bite, disease agents have been demonstrated only by the injection of saline suspensions of ticks into susceptible animals.

The survival of the agent of Tobia petechial fever in *O. rubis* sent from South America to the U.S.A. demonstrated persistence for at least 11 days, whilst South African tick-bite fever survived for 36 days in *O. moubata* sent from South Africa, and spring-summer encephalitis for 40 days in *O. moubata* sent from Russia. In the last case, the use of *O. moubata* made it possible to send this virus from Russia to the U.S.A. when other methods of transmission failed.—U. F. RICHARDSON.

STEWARD, J. S. (1943). **Trombicula autumnalis Shaw and its Association with Seasonal Pruritus in the Dog.**—*Vet. Rec.* **55.** 289–290. **2901**

From observations over a period of ten years, S. concludes that some cases of general pruritus in dogs during the summer months can be attributed to the presence of the harvest mite, *T. autumnalis*. The symptoms are those of general irritation. The mites tend to congregate in the interdigital fossae where they can usually be seen as salmon- or straw-coloured specks just visible to the naked eye.—J. B. CRAGG.

See also absts. **3005** (hide damage by warbles), **2961-2963** (insecticides), **2858**, **2861**, **2864**, **2867** (vectors of equine encephalomyelitis), **2879-2881** (of human neurotropic viruses).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

BHALERAO, G. D. (1942). **On Two Helminths of Domestic Ruminants in India.**—*Parasitology.* **34.** 133–137. **2902**

B. describes and figures *Cymbiforma indica* n.sp., a monostome trematode occurring very commonly in the alimentary canal, especially the small intestine, of sheep and goats at Mukteswar. The worm has also been found in bulls, but two buffaloes examined were not infested. The eggs bear slender, pointed polar filaments which apparently increase in length as the eggs mature.

Mention is also made of the finding of *Capillaria bilobata*, previously described from the abomasum of cattle, in the small intestine of a goat at Mukteswar. —E. S.

TUNKER, H. F. (1940). Ueber den Einfluss verschiedener Temperaturen und von Trockenheit auf die Entwicklung der Jugendstadien der Helminthen bei anatolischen Schafen. **[Effect of Heat and Drying on the Viability of Helminth Parasites of Anatolian Sheep].**—*Arb. Yüksek Ziraat Enst. Ankara.* No. 71. pp. 30. [In German and Turkish]. [Abst. in *Helminth Abstr.* **9.** 131, copied *verbatim.* Signed: B. G. P.] **2903**

Tunker found that *Fasciola hepatica* ova are killed by a temperature of –4°C. in 2½ hours, and by desiccation in 24 hours: they become non-viable after a week at 2°C. On the other hand, the ova of sheep trichostrongyles and horse strongyles withstand –4°C. for several days, and are not affected by gradual desiccation.

*ROUBAUD, E., & DESCHIENS, R. (1941). Essais relatifs à la prophylaxie de l'anguillulose du mouton par l'usage des Hyphomycètes prédateurs du sol. **[Experimental Prophylaxis of Strongyloidosis in Sheep by Means of Predatory Fungi in the Soil].**—*C. R. Soc. Biol. Paris.* **135.** 687. [Abst. from abst. in *Bull. Inst. Pasteur.* **40.** 34]. **2904**

Two lambs with no parasites other than a light infestation with *Strongyloides papillosus* were placed on each of two plots, both of which had been sown with *Bunostomum* eggs from sheep faeces, and one of which had received in addition numerous spores of various predatory hyphomycetes [see also *V. B.* **9.** 632, **10.** 594 & 848, and **13.** 57]. After 35 days on the plots, the animals were examined individually and autopsied. The animals from the plot containing the predatory fungi had lost their *Strongyloides* infestation and had not become reinfected, whereas the two from the plot not sown with fungal spores had a heavier *Strongyloides* infestation than formerly. All four animals, on the other hand, had acquired a *Bunostomum* infestation. The animals from the plot treated with fungal spores developed a lighter degree of infestation at a later date, and it is suggested that their source of infection may have been drinking water, to which the fungi could not gain access.

DICKEY, E. S. (1943). **Trichinosis: As Viewed by Different Interests.**—*J. Amer. vet. med. Ass.* **102.** 359–364. **2905**

Subclinical trichinosis is relatively prevalent in man in the U.S.A., infection being due to the ingestion of trichinosed pork. The feeding of uncooked garbage is considered to be the principal factor in perpetuating swine trichinosis. The views of the pig feeder, the meat packer, the consumer, and the public health services on this problem are considered, and the following method of control is suggested. Laws should be passed to place garbage feeding under the control of livestock sanitary authorities in each state, and permits should be granted for the feeding of cooked or uncooked garbage. When a permit is granted for the feeding of uncooked garbage, the swine fed should come under

quarantine and should be disposed of only by permit granted by the livestock authorities. They should be disposed of only for immediate slaughter to a plant operating under Federal (or comparable) meat-inspection laws. Such swine should be specially marked and only sold for human consumption after being cooked in such a way as to destroy any trichinae present. Two years after the passing of the laws, all permits for feeding uncooked garbage should be revoked and no more should be granted, permits issued after that date being only for the feeding of cooked garbage. The public should also be reminded of the fact that heating pork to a temperature of 137°F. kills all trichinae present.
—T. E. GIBSON.

WRIGHT, W. H., & BOZICEVICH, J. (1943). **Experiments in the Cooking of Garbage for the Destruction of Trichinae in Pork Scraps.**—*Publ. Hlth Rep., Wash.* **58.** 396–404. **2906**

The authors carried out a series of experiments in an attempt to determine how long garbage should be cooked in order to destroy trichinae in pork scraps contained in the garbage. Cuts of heavily infected pork were introduced into garbage which was then cooked by steam in an open container—the method of cooking most frequently used by pig feeders who cook garbage. In the centre of each sample a meat thermometer was inserted. After cooking, samples of the trichinous pork were removed to the laboratory, minced, and a 50 g. sample fed to five albino rats. Where there was still a further 50 g. of meat left, this was digested overnight in artificial gastric juice and the larvae recovered were counted. The rats were killed 46–48 days after feeding, the diaphragms examined for trichinae, and 50 g. of the skinned and eviscerated carcass were examined by the digestion method. A series of controls was run, using meat which had not been cooked but which had been held in the cold store until required for use.

Pork samples were given two types of heat treatment. In the first type, the samples were kept in the boiler for 10, 15, 20, and 30 min. after the garbage began to boil. In the second type, the samples were placed in cold garbage, the steam was turned off after the garbage had boiled for 30 min., and the samples were not removed until 60 min. later.

In the first series there were found to be considerable variations in the internal temperature of the samples of pork which were not always correlated with the size of the sample and the length of the cooking period, and were probably due to the fact that the temperature of the mass of the garbage was not uniform. In the second series, all the larvae were killed in all samples except in the largest of the pieces which measured 6 × 5 × 4 in. and weighed 4½ lb. In both series, there were no larvae surviving when the internal temperature of the sample had reached 56°C.

It is concluded that boiling garbage for 30 min. in an open container will destroy all trichinae in pieces of pork up to 3 in. in thickness, and probably in larger pieces if they are allowed to cool slowly. This procedure can be recommended as an effective measure for the prevention of the transmission of trichinosis to pigs by infected material in garbage.—T. E. GIBSON.

KATES, K. C., & SHORB, D. A. (1943). **Identification of Eggs of Nematodes Parasitic in Domestic Sheep.**—*Amer. J. vet. Res.* **4.** 54–60. **2907**

To enhance the usefulness of counts of worm eggs in the faeces for the diagnosis of intestinal parasitism in sheep, by identification of the eggs of the different species of worms, the authors have prepared photomicrographs of the eggs of 14 different species of nematodes, in stages typical of those seen in fresh faeces. Descriptions of the eggs of 15 species are given and in these descriptions details of structure have been stressed which have been found especially useful for purposes of differentiation.—T. E. GIBSON.

DENIO, R. M., & WEST, R. M. (1942). **The Foot-Worm Disease in Deer of the Northern Rocky Mountain Region.**—*J. Forestry.* **40.** 540–543. **2908**

A disease is described affecting whitetail deer (*Odocoileus virginianus* subsp.) and mule deer (*O. hemionus*) in western Montana. [The term "foot" is here used in the sense usual in comparative zoology, meaning the parts of the leg distal to the carpus or tarsus. The disease is caused by a filariid worm, *Onchocerca cervipedis*, which occurs chiefly in the subcutaneous connective tissue of these regions. "Foot-worm" is therefore an unsuitable term.—ED.] The life-history and mode of transmission of the parasite are unknown. Out of a total of 424 deer examined, 79 were infected. The concentration of infestation appeared to be directly proportional to the population density of deer in the region.—G. B. S. HEATH.

See also absts. **2896** (sheep nematodes), **2964**, **2965** (anthelmintics), **2851** (lungworms and swine influenza), **2928**, **2929** (parasitism and vitamin A deficiency).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

WARREN, S., & OLSHAUSEN, K. W. (1943). **Interstitial Cell Growths of the Testicle.**—*Amer. J. Path.* **19.** 307–331. **2909**

This is a detailed review of the literature dealing with hyperplasia and neoplasia involving the interstitial cells of the testicle in man. There are also protocols of two cases of hyperplasia and two of local neoplasm formation seen by the authors. Hyperplasia of the interstitial cells tends to occur whenever spermatogenesis is diminished. Among 29 reported cases of increase in number of interstitial cells, including the authors' own cases, 12 are classified as local neoplasia, one as local neoplasia accompanied by hyperplasia, and three as malignant. The criteria for this classification are discussed. There are 78 references, including some dealing with testicular growths in animals.
—E. G. WHITE.

EISEN, M. J. (1942). **The Occurrence of Benign and Malignant Mammary Lesions in Rats Treated with Crystalline Estrogen.**—*Cancer Res.* **2.** 632–644. **2910**

Rats of the inbred Sherman strain, which is not normally liable to spontaneous mammary lesions of the type produced in this work, were employed. A total dosage of 1–20 mg. of oestradiol dipropionate was administered subcutaneously to 63 females and 71 males of 3–5 weeks of age; in the majority of cases the hormone was dissolved and implanted in liquefied paraffin of M.P. 48°C. The survival times ranged up to 27 months, the greatest number of deaths occurring between the seventh and 12th months. Within one month of implantation, proliferative changes were noted in the mammary glands of both sexes [all animals in the experiment appear to have been so affected], and by the end of the second month there was evidence of marked secretory activity. This in turn was followed by dilatation and cystosis of the ducts, while after about six months the periductal connective tissues began to

proliferate, with a resultant fibrosis which in well marked cases resembled "chronic cystic mastitis" in human beings.

In six animals which survived for over eight months, there was late secondary epithelial proliferation, while in two other rats which survived for 376 and 803 days respectively, mammary carcinomas were present. These later changes are not thought to have been due to the oestradiol implantations, but to have arisen as a result of unknown additional factors after the fibrocystic lesion was established.—ALASTAIR N. WORDEN.

REICH, C., & DUNNING, W. F. (1943). **Studies on the Morphology of the Peripheral Blood of Rats. I. Normal Rats.**—*Cancer Res.* **3.** 248–257. **2911**

DUNNING, W. F., & REICH, C. (1943). **Studies on the Morphology of the Peripheral Blood of Rats. II. Rats Injected Subcutaneously with Carcinogenic Hydrocarbons. III. Rats with Induced and Transplanted Tumors.**—*Ibid.* 258–265 & 266–274. **2912**

I. Haemoglobin, red blood cell, and both total and individual white cell counts were carried out on rats of nine inbred strains, and from a group of hybrids. Sex differences were not constant throughout the strains, and the mean results for 2,656 rats were :– haemoglobin, 14·2 ± 0·02 g. per 100 ml.; r.b.c., 8·7 ± 0·01 millions per cu. mm.; white cells, 15·8 ± 0·08 thousands per cu. mm.; neutrophiles, 28%; eosinophiles, 2·2%; basophiles, 0·01%; lymphocytes, 64%; monocytes, 6%. Pregnant and lactating females had significantly lowered haemoglobin and r.b.c. values, the haemoglobin falling to its lowest seven days after parturition and returning to normal at the beginning of the fourth week. The strain with the highest spontaneous tumour history had the lowest percentage of haemoglobin.

II. Subcutaneous injection into rats of large (8–12 mg.) doses of methylcholanthrene suspended in solid paraffin proved toxic, most of the animals dying within 90 days. After 30 days, despite some early minor fluctuations, the only significant haematological alteration was a slight increase in the total white cell count. Later, in animals which had developed early tumours, haemoglobin decreased by an average of nearly 3 g. per 100 ml. and red blood cells by nearly a million per cu. mm., while white cells increased, the percentage increase in monocytes being approximately 200. Smaller doses (1–6 mg.) of methylcholanthrene were followed by an early rise in r.b.c. and white cell counts, but these changes were reversed after 40–50 days. The percentage of monocytes nevertheless remained high.

Following the injection of comparable doses of 3 : 4-benzpyrene, there was an early rise in the r.b.c. and monocyte counts, but the former returned to normal by the time tumours appeared, at which stage there was a significant decrease in the amount of haemoglobin present.

III. The continued growth of induced tumours (by methylcholanthrene and 3 : 4-benzpyrene) caused a reduction in haemoglobin and r.b.c. values, and an increase in the white cell counts, particularly in the case of neutrophiles. Similar changes resulted from the progressive growth of a variety of transplanted sarcomas.—ALASTAIR N. WORDEN.

See also abst. **2966** (chemotherapy of cancer).

DISEASES, GENERAL

CHLÁDEK, V. (1939). Mezinárodní seznam zvířecích nemocí. **[International List of Animal Diseases].**—*Zvěrolék. Obz.* **32.** 6–10; 138–145; 255–259 & 341–345. **2913**

The Czechoslovak National Committee of the 13th International Veterinary Congress entrusted to C. the task of examining the *Draft of an International List of Animal Diseases*, presented by Dr. P. J. DU TOIT of the Onderstepoort Laboratory [(1938). Pretoria: Govt. Printer]. C. adds to each main group, subgroup, and individual disease, referred to in the list, his own detailed comments and recommendations. The draft is here reprinted in Czech. C. then gives his own, partly modified, version in Latin, accompanied by a translation in Czech.

The articles deal with 107 groups of diseases (against a total of 244 in the South African draft), the balance of C.'s study being at present unavailable owing to war-time conditions. The part of the nomenclature covered in the available articles includes diseases caused (a) by bacteria, (b) by filtrable viruses, (c) by protozoa, (d) by helminths, and (e) by arthropods.

—J. ZWEIG.

I. BOLZ. (1942). Erfrierungen. **[Frost-Bite].**—*Tierärztl. Rdsch.* **48.** 240–243. **2914**

II. STOSS. (1942). Kälteschädigungen beim Pferde. **[Frost-Bite in Horses].**—*Dtsch. tierärztl. Wschr.* **50.** 444–446. **2915**

I. B. describes his experiences as a staff veterinary advisory officer with the German army in the extraordinarily cold winter of 1941–42 in Russia. During this period, the temperature remained below –15°C. for many successive weeks, with night frost of –30°, –40° and even –50°.

Horses adapted themselves well by growing long coats and were strikingly resistant to cold and to respiratory disease, the low incidence of the latter being due to the dryness of the weather. In horses on good rations, very little trouble from cold was observed and it was only overexertion, combined with underfeeding, which resulted in loss from general frostbite. Such cases rapidly became emaciated and if they lay down through weakness were usually certain to die.

Local frostbite was not common, but when it did occur it affected most commonly the penis and occasionally the ears. Cattle were rarely seen to be affected and when frostbite did occur it was usually the teats that were affected. The ears and tails of pigs, the feet of dogs and the comb and wattles of fowls were the predilection sites in these animals.

Three stages of frostbite are recognized :– erythema, oedema, and necrosis, the first two being curable without gross loss of tissue and the third resulting in loss of the part by dry or wet gangrene.

Horses with general frostbite were placed in a cold room which was gradually warmed during the course of hours. They were also rubbed with bristle brushes, etc. and given stimulants and later hot drinks.

Horses with local frostbite were treated by gradual thawing. The part was rubbed with snow and then bandaged, or rubbed with ointment. Oedematous tissue was incised and covered with an antiseptic and bandaged.

[According to the recent human medical literature (see GREENE—1941. *Lancet.* **241.** 689; an abstract by GREENE—1943. *Bull. War. Med.* **3.** 543—of a paper by FREY—1942. *Med. Klin.* **38.** 1009–1012, 1036–1038 & 1067–1069; an abstract by MCMICHAEL—1943. *Bull. War. Med.* **3.** 374—of a paper by BINHOLD—1942. *Dtsch. Militärarzt.* **1.** 491–496), the essentials of treatment for local frostbite are :– (1) very gradual

warming in the course of which the part is kept still and dry at a temperature of about 10°C. and is not allowed to warm to above 15°C. until the circulation has been restored, and (2) prevention of infection, which is effected by careful cleansing and disinfection. Rubbing with snow or anything else is contra-indicated. The rest of the body of the patient is treated by warmth and restoratives.

In general frostbite of the whole body, rapid warming by dry heat is indicated. Tetanus antitoxin is indicated as a routine.]

II. S. relates his experiences in Russia with frostbite in horses, including 15 cases in which the penis or prepuce was affected, one case in which both lips were affected, and several cases in which the extremities were affected, in some of which the whole hoof was shed. It appeared that frost acting on the hoof caused death and dry gangrene of the hoof matrix, but when acting first on the coronet region (skin) resulted in spreading we gangrene. Neither type was curable.—J. E.

I. Cates, J. S. (1941). **Revolution in the South.**—*Ctry Life, Garden City, N.Y.* July. 18–19 & 45. **2916**

II. Stewart, C. M. (1942). **A Condition amongst Military Dairy Farm Cattle in India, with Imported Blood, Resembling " Dry Coat " or " Non-Sweating " in Horses.**—*J. R. Army vet. Cps.* **13.** 117–120. **2917**

I. European breeds of cattle, when exposed to the hot, humid climate of the southern states of the U.S.A., do not thrive even when well fed. A condition develops which is similar to " dry-coat " or " non-sweating " of horses as seen in the tropics. The symptoms are acute respiratory distress and high temperature (up to 107·5°F.) with poor condition; the blood count drops very low and the animals do not sweat. Indigenous zebu cattle, however, show great resistance to the hot climate and also to tick infestation. The first crosses of the zebu with European breeds are also resistant to the condition and thrive to the extent of being, on an average, 300 lb. heavier than cattle of the European breeds at three years of age. This has established the zebu cross as a useful beef animal for cattle ranches in the southern states of the U.S.A.

II. The disease was seen among the grade Friesian cattle of the Military dairy herds in India. It occurs in warm weather and affects dry and milking cows and also young stock, indigenous zebu cattle being rarely affected. There is acute respiratory distress; some animals, known as " panters ", breathe through the mouth and have day temperatures of 106°F. or more, which fall at night, depending on the atmospheric temperature. Most of the affected cattle have a heavy rough coat, but clipping does not relieve the symptoms. Many are in poor condition.

S. refers to the condition described in I; he presumes the two conditions to be identical.

The rarity of the disease in breeds of horses indigenous to hot climates, particularly the Arab, is referred to. It is, however, an important disease of horses imported into India [see Stewart—*V. B.* **9.** 261].—J. A. Griffiths.

Stiles, G. W. (1943). **Heat Exhaustion in Young Turkeys.**—*Poult. Sci.* **22.** 242–247. **2918**

S. describes an outbreak of disease in a flock of 6,000 turkey poults of three weeks old, which occurred immediately after their removal from electrically heated batteries into a brooder, which appears to have been badly ventilated and to have contained no adequate shelter from the sun in the outside porches. The birds were moved at the hottest time of the year and without acclimatization to the changed condition.

Deaths (a total of 131) were thought to be due to heat exhaustion which resulted in lowered body temperature, sweating and prostration. Replacement of affected poults into suitable batteries brought about recovery.

There was no evidence of bacterial or parasitic disease in the flock. Cultures from P.M. specimens were sterile and there were no visible lesions in any of the internal organs. Some of the affected birds had shown peculiar head symptoms, but histological examination of the brains of three of these cases failed to reveal any definite pathological changes or microscopic alteration in the central nervous system.—J. D. B.

Quigley, G. D. (1943). **Is " Bluecomb " of Fowls Produced by Wheat ?**—*Poult. Sci.* **22.** 267–268. **2919**

Two feeding trials were undertaken to investigate whether the feeding of wheat is a factor in the causation of " blue comb " or " pullet disease ".

The laying performance and general appearance of birds fed on maize were better than in birds fed on wheat which had apparently caused disease diagnosed as " blue comb " in that same group of birds. In a younger lot of pullets, the same wheat failed to produce any signs of disease.

It was thought that these trials indicated that wheat, although not a direct cause of the disease, might have been a contributing factor.—J. D. Blaxland.

Bloomfield, A. L., & Lew, W. (1942). **Significance of Salmonella in Ulcerative Cecitis of Rats.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 179–182. **2920**

A specific strain of salmonella was regularly isolated from natural cases of chronic caecitis in rats. There was failure in attempts to set up caecitis in rats by feeding them with suspensions of the organism in the drinking water, but severe, generalized enteritis was caused by a heavy suspension. When a light suspension was administered daily for two months, the animals remained well.

From these observations, the authors conclude that some other agent is the primary cause of caecitis, salmonella being merely a secondary organism.

—M. H. Kyaw.

Swales, W. E., Crampton, E. W., Ashton, G. C., & Choquette, L. (1942). **Studies on Factors Influencing the Health of Pigs. I. The Relationship of Blood Haemoglobin Concentrations to Rate of Gain in Suckling Pigs.**—*Canad. J. Res.* Sect. D. **20.** 380–386. **2921**

The blood haemoglobin levels and daily gains in body weight of eight litters were studied in piglets which showed no clinical symptoms of anaemia but whose rate of growth was not entirely satisfactory. The failure of normal gains in weight during the first four weeks of life indicated a possible relationship of low haemoglobin levels to slow growth. Ferrous sulphate and reduced iron were used in another lot of litters to keep the haemoglobin concentration at higher levels, and statistical analysis showed a significant difference in body weight at weaning time between the treated and control groups, indicating that the period of slower growth can be modified by iron therapy. If cyclic periods of growth are normal in pigs, such a cyclic decrease in unweaned pigs can be influenced by a dietary supplement that keeps the haemoglobin higher. If normal growth is affected, it is probable that resistance to infection by animal parasites and other organisms is lowered. The practical considerations are briefly discussed.—R. Gwatkin.

Cole, C. L., & Moore, L. A. (1942). **Hydrocephalus, a Lethal in Cattle.**—*J. agric. Res.* **65.** 483–491. **2922**

The authors discuss a lethal factor in cattle (internal hydrocephalus) and suggest that it is a simple recessive in its mode of inheritance. The cases studied all

developed after daughter-sire matings in pure-bred Holstein-Friesian cattle. Two other conditions described, although not referred to in the title (asymmetry of bone structures, particularly of the skull and limbs, and a nervous condition called "jumpy"), may also be recessives and the available data suggest that the sire may have carried three rare recessive genes or that, alternatively, these may possibly be conditions linked with each other.—C. V. WATKINS.

MAW, A. J. G. (1942). **Crosses Between Inbred Lines of the Domestic Fowl.**—*Poult. Sci.* **21.** 548–550. **2923**

This paper describes work comparing the laying performance and mortality of the progeny from different types of crosses of inbred lines.

The mortality rate of chicks up to six weeks of age was at its lowest in the progeny of unrelated in-bred parents; progeny from crosses of this type was superior also to those from top-crosses, related inbred crosses, and random-bred Leghorns kept as controls. —J. D. BLAXLAND.

See also absts. **3012**, **3013** (livestock diseases in Canada), **3014-3018** (in New Zealand), **3019**, **3020** (in Ceylon), **3021** (in Palestine), **3023** (pathology text-book), **3004** (bacterial warfare).

NUTRITIONAL AND METABOLIC DISORDERS

NEAL, M. P. (1941). **Fat Necrosis Studies. IV. Observations on Peanut Fattened Hogs.**—*South. med. J.* **34.** 153–158. Discussion pp. 158–159. **2924**

N. has previously recorded [(1931). *Amer. J. clin. Path.* **1.** 251.] that the experimental feeding of the products of foodstuffs rich in lipase produces a characteristic fat necrosis in a variety of vertebrate species. Peanuts were among the lipase-containing foods employed in these studies, and as they are known to be associated with soft-fat formation in fattening pigs, a factory investigation was carried out in order to determine whether or not there was evidence of fat necrosis in animals so fattened.

A total of 8,324 pig carcasses was examined at meat-packing plants in southern Georgia at the height of the peanut-feeding season (December). The animals ranged from 60–600 lb. live weight, and had come straight from farms where either the small Virginian or the large Spanish variety of peanut had been fed. In five cases only was there evidence of fat necrosis, and in these cases the change was attributed to the presence of *Stephanurus dentatus*, the swine kidney worm.

It is concluded that the feeding of peanuts to fattening pigs is not associated with the production of fat necrosis, and that interpretations of fat necrosis not based on histologic studies to eliminate parasitic and other inflammatory foci are not dependable.—A. N. W.

VILLAMIL M., J. A. (1942). Contribución al estudio de las enfermedades por carencia de calcio, fósforo y magnesio en los animales domésticos en Colombia. **[Calcium, Phosphorus, and Magnesium Deficiency in Domestic Animals in Colombia].**—*Rev. Med. vet., Bogotá.* **11.** 565–601. [Also appeared in *Bol. mens. Direcc. Ganad., Montevideo.* **26.** 319–342, and **27.** 26–54. (1942–43)]. **2925**

The serum content of Ca, P, and Mg was determined in a large number of animals. The normal range and average were as follows (in mg. %): the number of animals used is given in brackets. Ca: cattle (316) 7·2–11·8, av. 9·58; sheep (33) 8·10–11·4, av. 9·68; horses (115) 8–14, av. 12·5; pigs (32) 9·5–12·7, av. 10·82. P: cattle (340) 5–16, av. 8·76; sheep (33) 5·86–13·44, av. 8·44; horses (115) 2·44–5·83, av. 3·86; pigs (32) 7·32–11·46, av. 9·49. Mg: cattle (15) 4·34–9·53, av. 7·38; sheep (33) 2·75–15·61, av. 7·42; horses (10) 1·04–9·02, av. 5·48; pigs (32) 4·24–11·12, av. 8·46.

There are also data for the serum content of these substances in a few cases of various diseases. It was noted that deficiencies of cattle and sheep usually tended to be in P content, while the horse usually showed a deficiency in Ca. The importance of carrying out an investigation of the blood serum before treating such conditions is stressed. The types of deficiency diseases, methods of treatment, and Ca : P ratios of plants of the type encountered in local pastures are discussed.—J. G. CARR.

MAREK, J., WELLMANN, O., & URBÁNYI, L. (1942). Untersuchungen über den Mineralstoffwechsel des tierischen Organismus. III. Mitteilung. Ueber die Wirkung von Ammonium Chlorid bzw. Ammoniumphosphat auf den Mineralstoffwechsel erwachsener Kaninchen bei kalkarmer bzw. bei kalkreicher Fütterung. IV. Mitteilung. Beeinflussung des Stoffwechsels durch Natriumhydrocarbonat bzw. durch Kalksalze bei erwachsenen Kaninchen mit kalkarmer bzw. kalkreicher Fütterung. V. Mitteilung. Beeinflussung des Mineralstoffwechsels junger wachsender Kaninchen durch Natriumphosphat bzw. Calciumcarbonat bei mittelgrosser Kalkversorgung des Körpers. VI. Mitteilung. Wirkung einer Daueremführung von Natriumcitratlösung auf den Calcium- und Phosphorstoffwechsel der Kuh und des Kaninchens. **[Investigations on Mineral Metabolism of the Animal Body. III. Action of Ammonium Chloride or Phosphate on the Mineral Metabolism of Adult Rabbits on a Calcium Rich or Poor Diet. IV. Metabolic Changes Induced by Sodium Bicarbonate or Calcium Salts in Adult Rabbits on a Calcium Rich or Poor Diet. V. Influence on the Mineral Metabolism of Young Growing Rabbits of Sodium Phosphate and Calcium Carbonate with Average Calcium Supply. VI. Action of Continuous Administration of Sodium Citrate Solution on Calcium and Phosphorus Metabolism in the Cow and Rabbit].**—*Arch. wiss. prakt. Tierheilk.* **77.** 204–214, 215–222, 291–299 & 300–307. [Absts. in *Nutr. Abstr. Rev.* **12.** 437 & 629, copied *verbatim.* Signed: I. LEITCH]. [For previous parts, see *V. B.* **12.** 387]. **2926**

III. Metabolism experiments were made on 2 groups, each of 2 pairs of full grown rabbits, the first pair in each group fed on oats and chopped oat straw, the other on oats and chopped lucerne hay. The intakes and excretions of water, dry matter, Ca, Mg and P were recorded. After a pre-period of 6 days, the first group was given approximately 2 to 5 g. NH_4Cl and the second approximately 3 to 6 g. $NH_4H_2PO_4$ per 10 kg. liveweight daily in solutions by stomach tube. Both salts caused acidosis, loss of weight and death in from 5 to 13 days in the rabbits on oat straw and in 16 to 19 days in those on lucerne. Death was preceded by convulsions. There was no significant difference between the effects of the two salts nor between these results and the effects of feeding any restricted diet high in P.

IV. Of two groups of 4 rabbits, 2 rabbits were fed on oats and oat straw and 6 on oats and lucerne. The first group was given in addition from 13 to 16 g. $NaHCO_3$ and the second either approximately 18 g. Ca lactate or approximately 19 g. $CaCO_3$ per 10 kg. liveweight daily by stomach tube. The $NaHCO_3$ caused

death in about 20 days but the Ca salts did not disturb health. The metabolism studies included water, dry matter, Ca, Mg and P.

V. Young rabbits, 34 to 42 days old and weighing 350 to 360 g. at the beginning of the experiment, were used. Of the original number, 2 were killed at once and analysed. The remainder was divided into 3 groups, each of 3, and given a basal diet of hay and oats. One group had a supplement of 32 g. per kg. ration of sodium dihydrogen phosphate and another a similar amount of calcium carbonate. The P supplement appeared to impair appetite and inhibit growth; the Ca supplement caused no disturbance but growth was poor. Analyses and histological examination of skeletons and analyses of whole bodies showed normal histological pictures throughout, but the bones of the controls were less easily sectioned than those of the two supplemented groups. Analyses showed slight increases of P and reduction of Ca in the group with the P supplement and the reverse changes in the group with the Ca supplement. The P group showed a relatively high water content of the body. The Mg content of bone was less in the P group than in the controls and still less in the Ca group.

VI. Experiments were made on a milking cow and a growing rabbit. The cow was given a continuous intravenous infusion of 300 g. of a 2·5 per cent. aqueous sodium citrate solution daily for 16 days. The rabbit was given sodium citrate by stomach tube. The diets were of moderately low Ca content. Tetany was not produced. Appetite was impaired but thirst increased. Milk yield was reduced. Ca excretion by the cow was increased by almost 80 per cent. and by the rabbit by 22 per cent. The increase was chiefly by the kidney and implied removal of bone salt.

SULLIVAN, M., & EVANS, V. J. (1943). **Nutritional Dermatoses in the Rat. VIII. Vitamin A Deficiency.** —*J. Nutrit.* **25.** 319–339. **2927**

Careful observations were made of the gross and microscopic changes in the skin of rats kept on a diet which was designed so as to be complete as far as possible in all known dietary essentials except vitamin A. This "uncomplicated" vitamin A deficiency syndrome differed in several particulars from previous authors' descriptions, and consequently similar observations were made on rats fed on various modifications of the original diet, to see how far other changes might be superimposed on the changes due to the vitamin A deficiency.

A diet with 5% yeast instead of 10%, and no vitamin E supplement, led to the development of cutaneous signs indicative of vitamin B deficiency superimposed on vitamin A deficiency. Supplements of thiamine, pyridoxine, pantothenic acid, riboflavin, and nicotinic acid prevented this effect, and delayed the onset of vitamin A deficiency symptoms very considerably. Rather fewer superimposed cutaneous signs, involving only diffuse symmetric alopecia on the neck, shoulders, and chest, were obtained on a diet containing 5% yeast, hydrogenated cotton-seed oil instead of lard (*i.e.* no unsaturated fatty acids), no choline chloride, and no vitamin E. A 5% yeast diet with no fat or choline hastened the development of cutaneous signs which were otherwise like those produced by the previous modification of the diet. Finally, rats fed on the standard vitamin A assay diet of the U.S. pharmacopoeia developed cutaneous signs of deficiency of vitamins A and B, while the control rats fed this diet + vitamin A developed signs of vitamin B deficiency.

It is emphasized that an optimum supply of other food factors must be provided in any study of uncomplicated vitamin A deficiency.—D. G. GILMOUR.

ROACH, R. W. (1943). **Two Cases of Avitaminosis A Encountered in Poultry.**—*Vet. Rec.* **55.** 265–266. **2928**

This is a clinical communication describing two cases where disease with heavy mortality appeared to have been associated with avitaminosis A. In the first, occurring in eight-month-old pullets, mortality was as high as 68% and in the second, which was further complicated by heavy parasitic infestation, there was about 40% mortality.

The livers of affected birds had a very low vitamin A content and cultural examination failed to reveal the presence of any significant organism.

Change of the diet to one containing a much higher vitamin A content resulted in cessation of symptoms and mortality.

From P.M. examinations, R. concluded that the avitaminosis A resulted in the accumulation of urates in the kidneys and in the development of excessive parasitic infestation.—J. D. BLAXLAND.

RILEY, E. G. (1943). **The Effect of Various Stages of Vitamin A Deficiency in the White Rat on the Resistance to *Nippostrongylus muris*.**—*J. infect. Dis.* **72.** 133–141. **2929**

Young white rats were placed on a diet deficient in vitamins A and D, and the course of avitaminosis-A followed by weekly determinations of vitamin A in the liver, as well as by the usual study of weight changes and external symptoms. The vitamin D deficiency was considered to be of no importance in the present connexion. Control rats were kept on a prepared dog food which was stated to be equivalent to the deficient diet plus cod liver oil. Six normal and six vitamin-deficient rats were infected each week with about 3,000 infective larvae of *N. muris* applied percutaneously, the peak daily egg output in the faeces being taken as a measure of the resulting degree of infection of a group. In the first two groups, infected 10 and 19 days after starting the diets, the normal rats had a slightly larger infection than the deficient rats, and a reduced degree of resistance was apparent for the first time in the rats infected after 26 days on the deficient diet. After this the infection of the deficient group became much more intense and prolonged than that of the normal group. Immune serum, injected intra-abdominally into a group of normal and deficient rats one day before infection, was relatively as effective in decreasing the peak of infection in both normal and deficient rats, as compared with nonimmunized rats infected at the same time. It is, however, suggested that in the deficient animals many of the worms may be merely slowed in their migration through the body of the host, since the infection was not brought under control by the 15th day as in a normal rat.—D. G. GILMOUR.

See also abstr. **2391** (digestion of protein and fat in horses), **2919** (wheat diet and "blue comb"), **3002** (food requirements of cotton rats.

PHYSIOLOGY AND ANATOMY

HOFFMANN, J. (1942). Über das Vorkommen von Spurenelementer, Insbesondere von Uran in Rinderleber und Milz. [**Occurrence of Trace Elements, Particularly Uranium in Ox Liver and Spleen**].—*Hoppe-Seyl. Z.* **273.** 115–117. **2930**

Analysis of a single specimen of each organ from

a normal animal indicated that the liver contained 8×10^{-6} per cent. U, and the spleen 9×10^{-6} per cent. U.—J. G. CARR.

AXELSSON, J. (1941). Das Futterverdauungsvermögen des Pferdes. [**Digestive Capacity in Horses**].—*Bierderm. Zbl.* [*B*] *Tiernährung.* **13.** 399–412. [Abst. in *Nutr. Abstr. Rev.* **12.** 504, copied *verbatim.* Signed: M. KLEIBER (U.S.A.)]. **2931**

Results of 71 digestibility trials with horses made during the last decades have led to the conclusion that in horses the apparent digestibility of proteini s on the average higher, that of fat lower, than the corresponding apparent digestibility in cattle as estimated by Kellner. The digestibility coefficient of organic matter is on the average 6 per cent. lower in horses than in cattle. The origin of the data is not stated.

DURAN-JORDA, F. (1943). **Formation of Red Blood Corpuscles.**—*Lancet.* **244.** 513–514. **2932**

The author advances a new explanation for the formation of the red blood corpuscles. The red cell is considered to be a product of cell secretion and not a result of cellular evolution. Although the accepted development is from the haematocytoblast through the stages of the erythroblast and normoblast to the non-nucleated red cell, the expulsion of the nucleus has not been demonstrated. Similarly, if the theory of karyolysis is accepted, the essential evidence of this theory, *i.e.* observation of dissolution of the nucleus in the protoplasm, has not been provided. Many other facts are not explained by the usual theory of evolution from the haematocytoblast. By studying 2·5 mm. embryos, the author has seen the original cells which he calls "stem cells" bursting and releasing spheroidal bodies, many of which are the size of r.b.c. These stem cells are similar to, if not identical with, the plasma cells which are distributed throughout the body.

The author formulates the following conclusions. Red cells are formed from plasma cells, and as these cells occur all over the body, r.b.c. must also be formed throughout the body. When the plasma cell disintegrates, the nucleus is extruded with a small halo of protoplasm and becomes what is known as the "normoblast". The r.b.c. is a droplet of colloidal nature similar to the fat droplets in milk. The lymphocyte is a stage in the development of the normoblast. Platelets are remnants of the fragmenting protoplasm of the original plasma cell when it breaks up.

The article should be consulted in the original by those interested in erythropoiesis.—D. L. HUGHES.

ALFREDSON, B. V., & SYKES, J. F. (1942). **Electrocardiograph Studies in Normal Dairy Cattle.**—*J. Agric. Res.* **65.** 61–87. **2933**

Electrocardiographs from 97 animals were made, three records being taken from each at different periods and the leads were placed in three positions during each examination. Four principal types of graph were obtained :– (1) those in which the R wave predominated in at least two of the leads; (2) those in which the Q R S complex was diphasic; (3) those in which the Q wave predominated in at least two of the leads, and (4) those in which the potential was uniformly small in all leads. Minor variations were found in the same animal from month to month, but no correlation was apparent between breed and the type of graph obtained, neither had gestation or lactation any apparent influence. —A. T. PHILLIPSON.

FEKETE, E., & DURAN-REYNALS, F. (1943). **Hyaluronidase in the Fertilization of Mammalian Ova.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 119–121. **2934**

The mechanism whereby the mammalian ovum is freed from the follicular cells surrounding it so that fertilization can take place was investigated. The effect on the follicular cells of several materials rich in hyaluronidase was studied by means of adding various concentrations of the test substance to each of one or two mouse ova surrounded by the cumulus oöphorus, suspended in Locke's solution in a watch glass. The subsequent changes were followed by means of the dissecting microscope. It was observed that preparations rich in hyaluronidase such as extracts from rattlesnake venom, leech tissues, and testicle were very active in dispersing the follicular cells surrounding the ova and it is suggested that hyaluronidase is responsible for this effect which is an indispensable step in fertilization. This observation confirms that of MCCLEAN & ROWLANDS [see *V. B.* **13.** 300].—R. ALLCROFT.

BULLARD, J. F., & ANDREWS, F. N. (1943). **Experimental Alteration of Thyroid Function in Cattle.**—*J. Amer. vet. med. Ass.* **102.** 376–381. **2935**

The possibilities of regulating the growth and fattening of cattle by alteration of the normal thyroid function were studied. Twelve steers ranging in age from 3–18 months were subjected to subtotal thyroidectomy. The surgical procedures are described at length. The amounts of thyroid removed varied from 17·1 g. to 51·8 g. In all animals during the first 4–6 weeks after recovery, the rate of gain of body weight was consistently accelerated, but after the sixth week the rate was reduced. Only two animals showed symptoms of thyroid deficiency. One made a spontaneous recovery, and the other responded favourably to the feeding of 1·3–3 g. of desiccated thyroid gland per day for two months. All of the steers were eventually slaughtered and with one exception showed appreciable amounts of thyroid tissue varying from 6·9–102·4 g. Histological study of this tissue showed that marked hypertrophy and hyperplasia followed the operation.—D. D. O.

I. *CALCAGNO, I. R. (1941). **Development of Bundle of His in Bovine Embryos.**—*Rev. Soc. argent. Biol.* **17.** 213–220. **2936**

II. *CALCAGNO, I. R. (1941). **Development of Auriculo-Ventricular Node in Bovine Embryos.**—*Ibid.* 221–228.

[Absts. in *Brit. Chem. Physiol. Abstr.* Feb. 1942. pp. 79 & 80, copied *verbatim.* Signed: I. T. L.] **2937**

I. Embryos of 4 mm. and more were examined. The bundle appears in embryos of 10–12 mm. in the spongy layer of the highest part of the interventricular septum as a nucleus which is continuous with the spongy tissue of both sides of the septum. In the 15–20-mm. embryo it comes in contact with the origin of the auriculo-ventricular node situated in the musculature of the auriculo-ventricular canal. In the 20–30-mm. embryo the branches of the bundle become differentiated and part of the spongy tissue develops into Purkinje cells. In the 50–70 mm. embryo this differentiation is complete and the subendocardial connective tissue is well developed.

II. In 70-mm. embryos the interventricular septum is completely developed. In the membranous part of this septum, the node is completely differentiated and its cells differ from those of the bundle of His, with which it is continuous. In 30-mm. embryos the continuity of the bundle and node is not complete. The first appearance of the node was seen in 12-mm. embryos in the internal layer of the musculature of the auriculo-ventricular canal, without any contact with the bundle. Definite differentiation was seen only in 15–20-mm. embryos.

See also absts. **2921** (growth and haemoglobin level in pigs), **2911** (blood picture of rats), **3002** (reproduction in cotton rats), **2910** (oestrogens and tumours).

POISONS AND POIONING

VEILLEUX, J. M. (1941). Intoxications chez les bovins. **[Poisoning in Cattle].**—*Canad. J. comp. Med.* **5.** 283–287. [In French]. **2938**

A brief discussion on types of poisoning commonly encountered by practitioners, *viz*, by arsenic, lead, and due to chemical fertilizers.—R. GWATKIN.

SCHULZE, H. G. (1941). Akazienvergiftungen bei Pferden. **[False Acacia Poisoning in Horses].**—*Berl. Munch. tierärztl. Wschr.* Feb. 7th. 65–66. [See also *V. B.* **11.** 191]. **2939**

S. describes five cases of poisoning by ingestion of the leaves of *Robinia pseudacacia*, and five more severe cases following ingestion of the bark and stems. He considered that the symptoms indicated cyanide poisoning, as is found following feeding of true acacia species, and treated it as such (purgative, potassium permanganate solution, and cardiazol) with good results, no animals dying.

[S. has evidently failed to realize the difference between *Robinia pseudacacia* and the true acacias. The latter do contain a cyanogenetic glucoside, but the former contains a toxalbumin called "robin" which appears to have been responsible for the toxic symptoms described by S.].—J. G. CARR.

MEZEY, K. (1942). Toxicidad y acción farmacodinámica de la Jussiaea peruviana Linn (Yerba de Rejo). **[Toxicity and Pharmacology of *J. peruviana*].**—*Rev. Med. vet., Bogotá.* **11.** 617–627. **2940**

A description of the plant *J. peruviana* and its local occurrence is given. It is responsible for a number of deaths among cattle. A saline extract was tested on various laboratory animals, and it was concluded that the toxic effects are due to the presence of choline.

—J. G. CARR.

HINSHAW, W. R., & MCNEIL, E. (1943). **Experiments with Sulfanilamide for Turkeys.**—*Poult. Sci.* **22.** 291–294. **2941**

Sulphanilamide has been reported as being beneficial when administered in fairly large doses to turkeys and pheasants infected with blackhead, but the authors' results indicate that the drug is dangerous for these birds. Premature expulsion of eggs results even after a single dose of 0·5 grain per lb. body weight. The drug killed 50 of 60 nine-week-old Bronze turkeys when given as a single dose of 3·0 grains per lb. weight and two four-month-old birds when given in four daily doses of 1·0 grain per lb. weight. Loss in weight, cyanosis, and uraemia resulted when 0·6–0·75 grain per lb. weight was administered to 4½-month-old turkeys. No ill effects were evident in adult Bronze males after receiving 0·6 grain per lb. weight on two successive days.—C. HORTON SMITH.

ANCEL, P., & LALLEMAND, S. (1942). Sur une alm-formation du bec et des membres obtenue, chez l'embryon de poulet, à l'aide de sulfamides. **[Beak and Limb Malformation Produced in Chick Embryos by Means of Sulphonamides].**—*C. R. Soc. Biol. Paris.* **136.** 255–256. **2942**

Injection of 1·25 mg. of sulphanilamide into two-day chick embryos resulted in a shortening of the limbs of all embryos, 80% showing also a pronounced parrot-beak. Most of the embryos were dead at 20 days, and all failed to hatch. There was sometimes a notable bending of the tibio-tarsis. These effects could be recognized at ten days. Injection of 0·75 mg. produced the effect in about half the treated embryos, while 0·25 mg. had no such action. The sulphonamide soluseptasine, affected all embryos when 15 mg. were given, and rather less than half when 3 mg. were given. Albucid [sulphacetamide] had the same action when 15 mg. were given, half this dose affected 20%, while 3 mg. had no action.—J. G. CARR.

—. (1941). **Ministry of Food. Food and its Protection against Poison Gas.** pp. 18. London: H.M. Stat. Off. [2nd Edit.] [8vo] [3d.] **2943**

A concise account is given of the various war "gases" and protective measures. Their effect on foodstuffs, growing crops, and animals is described, together with methods of decontamination. The responsibility for dealing with contaminated foodstuffs rests with the local authority and a brief outline of the organization is given.

The effect of the lung irritant gases on foodstuffs is dealt with in a more assured manner than previously. Foods exposed to high concentrations of phosgene for periods of one hour were, after 24–28 hours' airing, found fit to eat.

Animals exposed to gas vapour should be slaughtered at once, the offals condemned and, in the absence of fever and other abnormalities, the flesh should be edible.

The problem of liquid mustard gas and its effect on livestock is more complicated, but more definite instructions than formerly are now given. An animal badly splashed should be rapidly decontaminated and then slaughtered and, after the flesh underlying any lesions has been cut away and the offals discarded, it can be considered safe for consumption. It is emphasized, however, that the examination of the affected carcasses should be based on general rules for meat inspection except when an animal becomes ill as a result of liquid arsenical gas contamination, when the carcass will be unfit for consumption.

An appendix enumerating the protective values of materials used for holding or covering foodstuffs is given.—H. E. BYWATER.

See also absts. **2831, 2832** (HCN production by bacteria).

THERAPEUTICS AND DISINFECTION

MCILWAIN, H. (1943). **Biochemistry and Chemotherapy.**—*Nature, Lond.* **151.** 270–273. **2944**

In this review of the interrelationship between chemotherapy and biochemistry, the author traces the development of contemporary ideas of drug action from the conceptions prevailing at the close of the 19th century, through the periods of receptor theories when chemotherapy was completely out of touch with contemporary biochemistry and biochemical hypotheses, to the present position in which the application of current biochemical advances and knowledge has led to the establishment of the theory of competitive enzyme inhibition [see WOODS—*V. B.* **10.** 790.], and to the preparation of bacterial inhibitors by using growth-factor analogies [see MCILWAIN—*V. B.* **12.** 576, and **13.** 11]. He summarizes the present achievements of the interrelationship as follows:– (1) the specifying of the functions of some drug receptors, and the corollary that many known enzymes can be regarded as potential drug receptors; (2) the developing of general nutritional

methods for the investigation of drug action; (3) the ability to use such findings for the development of new inhibitory agents.—J. LOCHIEL MCGIRR.

I. ALEXANDER, F. (1943). **A Study of the Distribution of Sulphanilamide.**—*Quart. J. exp. Physiol.* **32.** 21–28. **2945**

II. ALEXANDER, F. (1943). **The Fate of Sulphanilamide in Sheep.**—*Vet. Rec.* **55.** 217–218. **2946**

I. Sulphanilamide was administered intravenously to sheep, rabbits, and mice as a 0·5% solution in saline and the drug concentrations in blood, urine, and tissue extracts were estimated.

The results indicate that, while the volume of distribution of sulphanilamide calculated at the end of one hour after the injection may be explained on the hypothesis of an even distribution through the body water, the values obtained at larger intervals of time do not support this explanation as the apparent volume of distribution, calculated six hours or more after the injection, becomes greater than the volume of the body. An explanation of the apparent contradiction between these findings and those of MARSHALL *et al.* (1937) is suggested.

A part only of the dose administered was recovered from the excretions in the sheep and rabbit. The possibility of the fixation of part of the drug in the tissues was investigated in rabbits by making drug estimations on filtrate of ground tissue treated with acid. The concentrations of the drug in the liver and kidneys were higher than those in the blood and in the former organ they increased with time. The amount of sulphanilamide retained by the tissues was, however, too small to account for the difference between the dose given and the quantity recovered from the urine. Therefore, the possibility of the drug being present in the body in a form not estimated by diazotization was also investigated. It was found by experiments on mice that, within three hours after injection, 30% of the compound had been destroyed or was changed into a form not estimated by diazotization even after acid hydrolysis.

II. The blood concentrations, excretion, and degree of acetylation of sulphanilamide in sheep following the administration of single intravenous doses (as a 0·5% solution in saline) showed that most of the sulphanilamide present in the blood was in the free form and clearance from the blood was exponential. Acetylation figures for sulphanilamide in the urine of five sheep expressed as percentage of the total dose given, gave a mean value of 50%. A single observation in a cow recorded 95% acetylation. In sheep excretion of sulphanilamide in the urine was half complete within six hours and almost complete in 24 hours. Sheep receiving doses of sulphanilamide of more than 100 mg. per kg. developed haematuria of 24 hours' duration.

In four experiments, sulphacetamide was also given intravenously as the sodium salt in 30% solution. The percentage of the dose of free sulphacetamide excreted in the urine of sheep within 24 hours of injection was approximately 2½ times as much as that of sulphanilamide under similar conditions, suggesting that the former drug would be the better urinary antiseptic of the two.—M. H. WEDDELL.

WAKSMAN, S. A., & WOODRUFF, H. B. (1942). **Selective Antibiotic Action of Various Substances of Microbial Origin.**—*J. Bact.* **44.** 373–384. **2947**

Investigations were carried out on the relative activity of antibacterial substances from micro-organisms and of certain chemical agents commonly used as disinfectants, by means of standard procedures for measuring bacteriostasis. Two Gram-negative bacteria, two spore-forming and two non-spore-forming Gram-positive bacteria, and two actinomycetes were used as test organisms and three different media were employed. The antibacterial substances investigated were:—actinomycin and streptothricin (from actinomyces), tyrothricin, tyrocidine, and gramicidin (from *Bacillus brevis*); pyocyanase and pyocyanin (from *P. aeruginosa*); gliotoxin and penicillin (of fungus origin); lysozyme (from egg-white); and phenol, tolu-*p*-quinone, lauryl sulphate, and sulphanilamide. Marked differences in the degree of sensitivity of the particular test organisms to the various substances were observed. Gramicidin was most specific, acting primarily on Gram-positive micrococci; purified penicillin was next in its specificity, followed by tyrothricin, tyrocidine, actinomycin, gliotoxin, and lauryl sulphate which acted primarily on Gram-positive bacteria and much less on Gram-negative organisms; pyocyanase, pyocyanin, and crude penicillin were found to be generally bacteriostatic over the wide range of test organisms used and in this resembled phenol and tolu-*p*-quinone; streptothricin was unique in its action, being highly active against certain Gram-negative bacteria and having no action against certain Gram-positive organisms. On a weight basis the substances of microbial origin were found to be stronger bacteriostatic agents than the chemical substances tested. It was also observed that a high bacteriostatic action was not necessarily accompanied by a high bactericidal action.

It is pointed out that considerable variation was obtained by the use of different test organisms and different media, *e.g.* 3–10 times as much actinomycin or streptothricin was necessary to cause the same inhibition in brain-heart-infusion agar as in nutrient agar. Eight criteria are put forward for use in the comparison of the selective action of antibiotic substances of microbial origin.—R. ALLCROFT.

BUSH, M. T., & GOTH, A. (1943). **Flavicin: An Antibacterial Substance Produced by an Aspergillus Flavus.**—*J. Pharmacol.* **78.** 164–169. **2948**

A description is given of the production, partial purification, and activity of an antibacterial substance named "flavicin" isolated from a mold belonging to the *Aspergillus flavus* group. Cultures of the mold grown on a modified Czapek-Dox medium at 35°C. were ready to be harvested 6–8 days after inoculation. A yield of 75–100% of the active material was obtained by filtration of the culture and extraction of the acidified filtrate with isopropyl alcohol followed by extraction of the ether-soluble substance with sodium bicarbonate. Details of the further partial purification are also given. Its activity was tested against 17 organisms and, like penicillin, it particularly inhibited Gram-positive cocci, but was found to be more active than penicillin against *Corynebacterium diphtheriae*, *Bacillus anthracis*, *Staphylococcus albus*, and *Brucella abortus*. It also resembles penicillin in being a water-soluble and ether-soluble organic acid unstable in an acid environment. Toxicity tests showed that the crude extract is very toxic, but by partial purification the toxicity is considerably reduced. Preliminary *in vivo* tests on ten mice infected intraperitoneally with pneumococcus type I showed that a total dose of 525 mg. per kg. body weight produced no toxic symptoms during a period of 51 hours when injected intraperitoneally and subcutaneously; the lives of six animals were considerably prolonged as compared with untreated controls, while the other four animals survived.

Investigation of the mode of action of flavicin indicated that its action is bactericidal.—R. ALLCROFT.

RAMMELKAMP, C. H. (1942). **Use of Tyrothricin in the Treatment of Infections. Clinical Studies.**—*War Med.* **2.** 830–846. **2949**

Observations are reported on the treatment with tyrothricin of 51 patients with 58 localized infections. Satisfactory results were obtained when the bactericidal substance was applied to 16 localized ulcers infected with *Streptococcus haemolyticus*, *Str. faecalis*, and *Staphylococcus aureus*, but when the ulcer contained both Gram-negative and Gram-positive organisms, the application of tyrothricin was without effect. It is suggested that the failure to kill the Gram-positive organisms was due to the production of inhibitory substances by the Gram-negative bacteria. In one case an ulcer did not heal completely after the application of tyrothricin over a period of 63 weeks and it was demonstrated that the organism (a strain of staphylococcus) had become markedly resistant to the action of tyrothricin during the period of therapy. The application of tyrothricin at the time of operation to 15 mastoid cavities infected with haemolytic streptococci was not sufficient to sterilize the cavities or to shorten the post-operative period, although a reduction in the number of positive cultures was observed. After more intensive therapy, however, during the post-operative period, sterilization of the cavities was effected.

In cases of pneumococcic and staphylococcic empyaemia no beneficial effects were observed after intrapleural injection of tyrothricin or after irrigation with tyrothricin, but one case of streptococcic empyaemia responded very well.

Treatment of 13 other miscellaneous infections gave no definite results. No serious toxic effects were noted in any of the patients treated with tyrothricin, but it is again pointed out that injection of tyrothricin into closed body cavities should be carried out with caution [see also *V. B.* **13.** 403].

Some of the factors which determine the effectiveness of tyrothricin therapy are discussed, and it is stressed that one of the most important factors in deciding whether an infection can be treated by tyrothricin is the accessibility of the infected area to local treatment, because tyrothricin is precipitated when it comes in contact with body fluids and the precipitated material must be in direct contact with the organisms in order to exert bactericial effect.—R. Allcroft.

Martin, F. E. (1943). **Treatment of Mastitis with Tyrothricin.**—*Vet. Med.* **38.** 174–177. **2950**

In a herd of 49 cows, kept under excellent conditions, 12 cows were found to be carriers of long-chain streptococci. Diagnosis was by micro-examination of incubated milk samples, two consecutive negatives at weekly intervals being taken as indicating absence of infection. Twenty-six quarters were treated with 40–100 mg. tyrothricin in mineral oil and in 20 infection was overcome, repeated treatment being required in some cases.

The economics of the procedure as applied commercially in the eradication of mastitis in a herd is discussed.—R. M. Arnold.

Udall, D. H., Johnson, S. D., & Ferguson, J. (1943). **Observations on the Treatment of Mastitis.**—*Cornell Vet.* **33.** 209–217. **2951**

A report of the treatment of 204 quarters in 100 cows clinically affected with chronic mastitis. Observations were made on the physical state of the udder, the strip-cup milk sample, the bromthymol-blue test, the cell count, and the stage of lactation and attempts were made to correlate the various findings. Abrupt variations in the quality of the milk were found without apparent cause.

Several drugs were used, including novoxil, but acriflavine is recommended. The reaction produced by various agents is discussed. It is stated that prognosis of treatment can be most reliably based on a careful clinical examination of the udder. Treatment late in lactation is more successful, 71·9% of dry cows responding as compared with 56·8% of the whole group treated. Prognosis becomes less hopeful with increasing fibrosis especially if the infection is with a "broad-zoned" *Streptococcus agalactiae*.

An outbreak of nonspecific mastitis associated with a faulty milking machine is described, and the role of teat sores in *Str. dysgalactiae* and *Str. uberis* infections is discussed.—R. M. Arnold.

Spencer, G. R., & Beach, B. A. (1943). **Effect of Injections of Novoxil on the Bovine Udder Infected with Mastitis Streptococci.**—*Amer. J. vet. Res.* **4.** 45–50. **2952**

Three quarters in two infected cows were treated during lactation with three injections of novoxil at 72 hourly intervals and a record was kept of the bacterial flora, the catalase content, the percentage of chlorides, and Hotis reaction of milk samples taken. The cows were slaughtered 16 days after treatment and were then still shedding streptococci although in reduced numbers. A histological study of the treated quarters revealed an acute inflammation superimposed upon a typical chronic mastitis. Giant cells present were associated with the particles of silver oxide.

Twenty-one infected quarters were treated with novoxil while dry. After calving, 17 showed improvement in the milk but infection was eliminated from only 11. There was little macroscopic change.

It is concluded that part of the bactericidal action of novoxil is due to the acute inflammatory action it provokes, but that this need not militate against its use. The comparative merits of treatment while the animals are dry or lactating are discussed.—R. M. Arnold.

Smith, M. I., Emmart, E. W., & Stohlman, E. F. (1943). **The Action of Some Derivatives of 4-4′ Diaminodiphenylsulfone in Experimental Tuberculosis.**—*Amer. Rev. Tuberc.* **48.** 32–39. [Spanish summary]. **2953**

In view of the excessive toxicity of 4–4′ diaminodiphenyl sulphone, a series of five derivatives was examined in an attempt to evaluate their effectiveness in experimental TB. in relation to their toxicity. Inhibition of growth in culture, toxicity, blood levels, and therapeutic effectiveness in tuberculous g. pigs were studied. Their results lead the authors to conclude that, having regard for all the factors involved, the N-phosphoryl derivative of diaminodiphenyl sulphone is a superior chemotherapeutic agent to the sulphonated glucose derivative (promin) which, in turn, is better than the nitro hydroxy, or the sodium formaldehyde sulphoxylate derivatives. They remark, however, that none of the drugs so far tested has proved adequately effective in completely preventing experimental TB. in g. pigs, though some of them appear to be capable of considerably ameliorating the disease.—J. Lochiel McGirr.

Steenken, W., Jr., & Heise, F. H. (1943). **Action of Promin and Diamino-Diphenyl Sulfone upon Tubercle Bacilli; Antipromin Action of p-Aminobenzoic Acid.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 180–183. **2954**

The action of promin and its parent substance, diamino-diphenyl sulphone, upon virulent and avirulent mutants of human tubercle bacilli, and the effect of *p*-aminobenzoic acid on this action, were investigated. The cultures were grown on Steenken and Smith's solid medium, and on Proskaner and Beck's liquid medium. With the solid medium the addition of 40 mg. promin % was required to produce definite inhibition of growth, its effect being more marked in the case of the avirulent mutant: a comparable degree of growth inhibition was

produced by 1·6 mg. diaminodiphenyl sulphone %. [On the basis of this finding the authors suggest that the latter compound may be more effective than the former against tuberculosis in g. pigs: the question of toxicity is, however, important—see SMITH *et al*, preceding abst.] Using the liquid medium, *p*-aminobenzoic acid (5 mg. %) was found to exert a marked anti-promin effect, the conclusion being that this action is similar to the antisulphonamide action of *p*-aminobenzoic acid as described by WOODS [*V. B.* **10.** 790].—J. L. McG.

ARTHUR, G. H. (1943). **Sulphapyridine (M & B 693) in the Treatment of Bovine "Summer Mastitis". A Case Report.**—*Vet. Rec.* **55.** 229. **2955**

Case records are given of the treatment of five cows affected with *Corynebacterium pyogenes* mastitis, in which sulphapyridine was given by drench and M & B 730 (a neutral derivative of sulphapyridine) and sulphacetamide were used by udder infusion. Three of the cows also received a single injection of *Corynebact. pyogenes* toxoid, administered in two cases one and two months previous to infection. None of the cases described responded to treatment and A. concludes that sulphapyridine exerts no specific curative effect in *Corynebact. pyogenes* mastitis in doses normally employed in veterinary practice. This view is contrary to that expressed by THOMPSON [*V. B.* **11.** 715.], but agrees with that of ROACH [(1942). *Vet. Rec.* **54.** 471].—M. H. W.

*BOSCHNAKOFF, M. (1941). Ricerche sull'azione di un sulfamide su di un ceppo di Pasteurella equiseptica (Lignières) in "vivo" e in "vitro". [**The *in vivo* and *in vitro* Action of a Sulphonamide Compound on a Strain of *Past. equiseptica*.**]—*Boll. Soc. int. Microbiol. sez. Ital.* **13.** 78–82. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 457]. **2956**

The sulphonamide, streptosil, had no action on the organism *in vitro*; intramuscular inoculation of g. pigs infected intraperitoneally with 0·5 ml. of a bacterial suspension made from "2 drops" in 1 litre delayed death by 3–7 hours as compared with controls.—J. G. C.

YUTUC, L. M. (1936 & 41). **Experimental Studies on the Curative Treatment of Surra in Native Horses in the Philippines. II. III, With a Report on the Results Obtained in British North Borneo.**—*Philipp. J. Sci.* **61.** 401–414, and **75.** 105–129. [For part I, see *V. B.* **5.** 95]. **2957**

II. Ten horses were experimentally infected with *Trypanosoma evansi* either subcutaneously or, in two cases, intrathecally, and treated when the cerebrospinal fluid was known to be involved. Treatment with simultaneous intrathecal and intravenous injections of naganol was unsuccessful. Three of the animals were then given simultaneous intravenous injections of etharsanol (*p*-*β*-hydroxy-ethylamino phenyl arsenic acid) and naganol in repeated doses varying from 1·77–2·24 g. and 0·59–1·49 g. respectively. The animals recovered, and were in good condition when observed 1–2 years after the beginning of treatment, complement-fixation, animal inoculation, and blood tests all being negative at that time.

III. In further studies on the treatment of surra, one naturally, and six experimentally, infected horses failed to respond to treatment with naganol and atoxyl given simultaneously in a single large dose or in fractional subtoxic doses.

In another experiment, naganol and sodium antimonyl tartrate were administered in slightly toxic amounts. Two of five experimentally infected, and one of three naturally infected horses, recovered. In three of the treated animals, death was apparently due to the toxic effects of the sodium antimonyl tartrate.

In an outbreak in North Borneo, in which the principal vector appeared to be *Tabanus fumifer*, 100 horses, showing trypanosomes in the blood but no clinical symptoms, were treated. Of 90 given doses up to 3·0 g. naganol and 1·5 g. sodium antimonyl tartrate, 61 survived. The other ten horses treated were from a different area in which infection was possibly more advanced. A simultaneous injection of 2·0 g. naganol and 1·3 g. sodium antimonyl tartrate was given; only two animals survived.

All the horses showed symptoms of naganol poisoning in the form of periproctitis, which disappeared after about three weeks.

DEARBORN, E. H., KELSEY, F. E., OLDHAM, F. K., & GEILING, E. M. K. (1943). **Studies on Antimalarials. The Accumulation and Excretion of Atabrine.**—*J. Pharmacol.* **78.** 120–126. **2958**

Dogs were used to determine the amount of atebrin excreted in the urine and faeces and the amount of accumulation of the drug in the tissues after small daily oral doses of either 5 or 50 mg. per kg. body weight for different periods up to 13 weeks. Results showed that throughout a period of four weeks the amount of atebrin excreted in urine and faeces was less than 6% of the daily dose and after two weeks the average daily excretion was stabilized at a level of less than 4% of the daily dose. Tissue analyses indicated that maximal concentrations were attained in 1–2 weeks, although the range of values obtained from the 24 dogs used was wide. Those animals which received 50 mg. per kg. body weight had a tissue concentration of the drug approximately ten times higher than those which received 5 mg. per kg. In a few dogs which received sulphathiazole or sulphadiazine simultaneously with atebrin, the tissue concentrations of atebrin were considerably lower than in those which received atebrin alone, but the blood levels of the sulphonamides were not affected.

It was found that cellulose-acetate-phthalate was a suitable coating for administering relatively large doses of atebrin as no vomiting occurred and about 80% of the drug was absorbed.—R. ALLCROFT.

CHRISTENSEN, J. F., & FOSTER, A. O. (1943). **Further Studies with Sulfaguanidine in the Control of Ovine Coccidiosis.**—*Vet. Med.* **38.** 144–147. **2959**

The authors found that sulphaguanidine prevented coccidiosis in feeder lambs. Small prophylactic doses of sulphaguanidine given as 0·2% of the ration during incubation and expected clinical periods of infection prevented clinical symptoms and almost completely suppressed oocyst discharge. A group receiving therapeutic treatment with a 0·45% concentration of sulphaguanidine in the feed, for eight days beginning on the first appearance of clinical symptoms, failed to show any improvement over the untreated controls.

—C. HORTON SMITH.

BOUGHTON, D. C. (1943). **Sulfaguanidine Therapy in Experimental Bovine Coccidiosis.**—*Amer. J. vet. Res.* **4.** 66–72. **2960**

When sulphaguanidine was administered to experimentally infected animals at a rate of 0·1 g. per kg. body weight for three weeks following the second day after infection, or in 5 g. doses for eight days following the 13th day after infection, favourable results were obtained. The drug was not effective in infections of *Eimeria alabamensis*, which is of minor importance in the production of fatal infections, but it was effective against the more economically important species, *E. bovis*. B. explains the difference in the effect of the drug on the two species on the grounds that the merozoites of *E. bovis* are exposed to the contents of the intestinal lumen, and therefore to the slowly absorbed

sulphaguanidine, for a longer time than are those of *E. alabamensis*, for the reason that the violent bursting of the large schizonts of *E. bovis* releases great numbers of merozoites into the intestinal tract, in contrast to the small schizonts of *E. alabamensis*, whose merozoites probably penetrate adjacent host cells almost immediately. B. concludes that sulphaguanidine shows promise of being useful in the treatment of certain types of bovine coccidiosis.—C. HORTON SMITH.

LAAKE, E. W. (1942). **Dry Application of Cube or Derris in Combination with Wettable Sulfur for the Control of Cattle Grubs.**—*J. econ. Ent.* **35.** 112. **2961**

Warble-fly larvae may be effectively treated by dusting the backs of cattle with a mixture of equal parts by weight of wettable sulphur (325 mesh) and finely ground (200 mesh) derris powder containing 5% rotenone.—W. MOORE.

SHAW, A. O., SMITH, R. C., ATKESON, F. W., FRYER, H. C., BORGMANN, A. R., & HOLMES, F. J. (1943). **Tests of Fly Repellents of Known Ingredients and of Selected Commercial Sprays on Dairy Cattle.**—*J. econ. Ent.* **36.** 23–32. **2962**

In a series of tests extending over two years, the effectiveness of a pyrethrum stock spray was found to increase with increase of concentration of pyrethrins up to 5% of a 20 : 1 concentrate. The addition of D.H.S. activator [ethylene glycol ether of pinene] or of pine oil did not produce any significant difference over the original mixture.

A 3% solution of Thanite [fenchyl thiocynyl acetate] in base oil was found to be the most effective of all the sprays tested both for repelling fly attack and for persistence.—W. MOORE.

TAUBER, O. E., TAUBER, A. H., JOYCE, C. R., & BRUCE, W. N. (1943). **Toxicity of Some Dinitrophenols to the American Dog Tick, *Dermacenter variabilis* (Say).**—*J. Wash. Acad. Sci.* **33.** 97–105. **2963**

Of a number of substances dusted on to various stages of *D. variabilis* in the laboratory, ammonium dinitro-*o*-cresylate gave most promise as an acaricide, a 12% concentration in dusting sulphur being equal in toxicity to 25% dinitro-*o*-cresol (DN-o-C) when applied in equal dosages. Dinitro-*o*-cyclohexylphenol and dinitro-*o*-secondary butylphenol appeared nearly as toxic as DN-o-C, while undiluted sodium arsenite was less toxic that DN-o-C diluted at 25% with sulphur. Sulphur alone showed a small toxicity. Dinitrosoresorcinol, guanidine dinitro-*o*-cresylate, and the tetra-, penta-, and hexa-chlorophenols gave little promise as acaricides.—W. MOORE.

THORP, W. T. S., & KEITH, T. B. (1943). **Use of Phenothiazine for Sheep Compared with Other Anthelmintics. Suggested Method of Administration.**—*Vet. Med.* **38.** 215–220. **2964**

Egg counts were carried out at weekly intervals for six weeks on 82 sheep (62 lambs and 20 ewes) which were then divided into seven groups and used to compare the relative efficiency of several commonly used anthelmintic drugs. Treatment was carried out every 21 days. Group I sheep each received a 2·5 ml. capsule of tetrachlorethylene ; group II sheep each received 12·5 g. of phenothiazine in capsule ; group IV sheep were each given 2 oz. of a nicotine sulphate solution made by mixing 1 oz. of nicotine sulphate with 2½ quarts of water ; group V sheep each received 2 oz. of a solution made by mixing 1 oz. of nicotine sulphate and 1 oz. of copper sulphate with three quarts of water ; group III were controls ; group VI received a mixture composed of nine parts of common salt and one part of phenothiazine, administered to them in the same way as an ordinary salt lick ; and group VII were placed on the same salt mixture one week after they had been drenched with 12·5 g. of phenothiazine per lamb and 25 g. per ewe. All sheep were pastured in the same paddocks and were given the same general care, except that groups VI and VII were segregated when the salt licks were given as they were to have the specially prepared lick containing phenothiazine.

All the methods of treatment effected a reduction in the egg counts of the treated sheep, but only in the case of those treated with phenothiazine were the counts kept at a consistently low level. Copper sulphate + nicotine sulphate mixture was more efficient in reducing the egg count than tetrachlorethylene or nicotine sulphate used alone, but it was not as efficient as phenothiazine. The counts of tapeworm eggs were unaffected by phenothiazine. The salt-mixture method of administering phenothiazine was shown to be very effective, and was continued overwinter without any toxic effects being shown.—T. E. GIBSON.

COLLIER, H. B., & ALLEN, D. E. (1942). **Enzyme Inhibition by Derivatives of Phenothiazine. III. Catalase, Cytochrome Oxidase, and Dehydrogenases.**—*Canad. J. Res.* Sect. B. **20.** 284–290. [For part III, see *V. B.* **13.** 416]. **2965**

Attempts were made to elucidate the mode of action of phenothiazine derivatives upon living organisms. Phenothiazone and thionol inhibited the succinoxidase activity of beef heart. Leucophenothiazone inhibited liver catalase and cytochrome oxidase ; phenothiazone sulphoxide inhibited catalase strongly, particularly in an acid medium. The effect of these compounds upon the enzyme systems of actual organisms is discussed.—W. E. SWALES.

BOYLAND, E. (1941). **Experiments on the Chemotherapy of Cancer.**—*Chem. Indust.* **60.** 219–220. **2966**

A brief account of the substance of a lecture. The four types of approaches in chemotherapy favoured at the present time are the use of :– (1) heptaldehyde and related compounds ; (2) some extracts of normal tissues, claims for inhibition of tumour growth having also been advanced for some natural bases such as cadaverine ; (3) catalase poisons, such as the nitrosophenols ; (4) diamines with the amine groups at the end of the molecule, such as 4 : 4′-diaminodiphenylether. The last two groups are probably too toxic for the prolonged course of treatment needed in treating human cancer.—J. G. CARR.

GOLDBLATT, M. W., & OAKESHOTT, S. H. (1943). **The Inactivation of Phosphorus on the Skin.**—*Brit. med. J.* Jan. 30th. 128–129. **2967**

The authors recommended the following removal and inactivation agent for phosphorus on the skin, whether it is present in solid form, dissolved in solvents (CS_2, benzene, mineral oil), or dissolved in solvents containing rubber, such as may occur in warfare or industry. The agent consists of copper oleate (25 g.), trichlorethylene (35 g.), Turkey-red oil (25 g.) and surgical spirit (15 g.), which fulfils all requirements and leaves the skin clean.

SCHNORR, O. (1940). Prüfung der Wirkung von Reinigungsmitteln auf die menschliche Haut. I. Mitteilung : Das Verhalten bei Hautgesunden. **[Effect of Cleansing Materials on the Human Skin. I. Healthy Skin].**—*Arch. Gewerbepath. Gewerbehyg.* **10.** 409–421. **2968**

SCHNITZLER, M. (1940). Prüfung der Wirkung von Reinigungsmitteln auf die menschliche Haut. II.

Mitteilung: Das Verhalten bei Hautkranken. **[Effect of Cleansing Materials on the Human Skin. II. In Skin Diseases].**—*Ibid.* 422–436. **2969**

[Absts. from absts. in *Bull. Hyg., Lond.* **10.** 53.]

I. The value of ten representative soap cleansers for the hands was compared by estimation of the pH of the treated skin by means of a quinhydrone electrode electrometer, of the rate of evaporation of moisture from the hand in a closed chamber by the decrease in the electrical resistance of a pure synthetic salt crystal, and of subcutaneous swelling by measurement of the diffuse reflection of light from the deeper skin layers by means of a selenium cell.

Increase in the pH value of the skin, in the rate of evaporation of moisture, and in subcutaneous swelling was considered indicative of an injurious effect on the skin, for reasons explained. By these criteria, the skin cleansers tested were grouped as suitable for regular use, suitable for all but sensitive skins, and suitable only for occasional cleansing of very dirty skin.

II. Methods similar to those employed in the previous investigation were used to compare the effect of skin cleansers on various skin disorders. The cleansing materials were thus grouped as:—alkali-free solid or liquid soaps of acid reaction suitable on the whole for use in skin disorders; alkaline soaps free from insoluble substances, unsuitable for long-continued use; and alkaline soaps with a kaolin, pumice or sand content, entirely unsuitable for any form of skin injury.

The use of cleansing materials with protective properties and the prohibition of the use of alkaline soaps are advocated in processes likely to cause industrial dermatoses.—R. O. Muir.

See also absts. **2941** (sulphonamide therapy in turkeys), **2942** (chick-embryo malformations from sulphonamides), **2830** (sulphonamide resistance of bacteria), **2895** (anthelmintics), **2914**, **2915** (treatment of frost-bite), **2985** (*in vitro* tests of germicides).

HYGIENE AND PUBLIC HEALTH

Black, L. A. (1943). **Milk Laboratories in War Areas.**—*Amer. J. publ. Hlth.* **33.** 824–832. **2970**

In order to determine the reasons for variations in results, a survey was carried out of 281 laboratories making official bacteriological milk analyses according to the "standard methods" of the American Public Health Association [see *Standard Methods for the Examination of Dairy Products* (1941). pp. 288. New York: Amer. Publ. Hlth Ass. (8th Edit.)]. Of these, 276 used the agar plate method; 27 also used direct microscopic examination, and 28 the methylene blue reduction method. Four laboratories used the direct microscopic method only, and one, the methylene blue method only. A note was made of the number of laboratories conforming to, or deviating from, the equipment, preparation, technique, and reporting required by "standard methods". Widespread divergence was found. The main points are dealt with at length. No laboratory met all the requirements in equipment and procedure, while only one conformed in preparation, one in incubation, 11 in counting, and 25 in reporting results. The greatest effects observed upon the accuracy of results were ascribed to improper counting largely due to inadequate counting equipment. The necessary steps to secure greater uniformity are discussed.—D. D. O.

Hershey, J., Waldrip, H., & Willett, J. C. (1943). **Trends in Laboratory Procedures in the Milk Control Program of St. Louis.**—*Amer. J. publ. Hlth.* **33.** 339–342. **2971**

The milk supply for St. Louis comes from over 4,000 producers all outside the city limits, and it is all pasteurized. 40,000 samples of raw milk are submitted to the methylene blue test each year.

The pasteurized milk is subjected to the phosphatase test and plate counts are made, although the value of the latter is considered small, since the general high standard of inspection and control tends to render such tests superfluous.—H. V. Hughes.

Terzich, I. M. (1942). **A Milk-Borne Outbreak of Gastroenteritis in Oklahoma City.**—*South. med. J.* **35.** 773–780. **2972**

An outbreak of food poisoning, affecting 71 persons, was traced to a highly contaminated milk supply. The milk was not properly pasteurized and contained haemolytic staphylococci, toxin-producing cocci, and organisms of the *coli-aerogenes* group in amounts sufficient to cause the clinical symptoms observed. Contamination is believed to have occurred through an employee at the bottling plant who had skin eruptions of the hands, arms, and face (no tests made).

Goldie, W., & Maddock, E. C. G. (1943). **A Milk-Borne Outbreak of Diphtheria.**—*Lancet.* **244.** 285–286. [Authors' summary copied *verbatim*]. **2973**

A small outbreak of diphtheria in a town in East Yorkshire was traced to a milk-supply. *C. diphtheriae* gravis was isolated from the milk on two occasions.

The wife of the farmer was found to be a throat carrier of *C. diphtheriae* gravis, and it seemed clear that she infected the milk while straining it.

The isolation of diphtheria bacilli from all cases and carriers and from the milk-supply was made on a tellurite-containing medium. Results on Löffler's medium were uniformly negative at two laboratories.

Williams, W. L. (1941). *Staphylococcus Aureus* **Contamination of a Grade "A" Raw Milk Supply.**—*J. Milk. Technol.* **4.** 311–313. **2974**

A brief review is given of the literature on the pathogenicity of staphylococcus enterotoxin, the coagulase test and the fermentation of mannitol being accepted as the best tests of pathogenicity.

Raw milk samples were examined from 387 animals of herds producing grade A milk; 67% gave high plate counts. 48% of individual samples contained "golden" staphylococci and 16% "white" staphylococci. Of the "golden" strains, 65% were coagulase positive and 58% fermented mannitol. In only 11 cows was *Streptococcus agalactiae* found. The authors point out the potential danger of enterotoxin in raw milk.—R. M. A.

Bowman, M. (1942). **An Epidemic of Typhoid Fever due to Infected Cheese. Manitoba, December 1939–March 1940.**—*Canad. J. publ. Hlth.* **33.** 541–547. **2975**

Three separate outbreaks are recorded. In each, cheese was the only common factor, but typhoid bacilli were not found in any sample. The product in question was made from raw milk and shipped to the wholesaler on about the tenth day. B. believes that cheese may constitute a serious hazard in the transmission of typhoid fever unless it be made from pasteurized milk or be adequately aged.—P. J. G. Plummer.

Hobbs, B. C., & Wilson, G. S. (1943). **The Cleaning and Sterilization of Milk Bottles.**—*J. Hyg., Camb.* **43.** 96–120. **2976**

In a survey of 105 milk-bottle washing plants in Greater London, 26 different types of plant were examined, 2,406 bottles being taken for sampling.

Taking all large plants together, 55·5% of the bottles had less than 600 colonies at 22° or 37°C. and only 1·1% had more than 25,000 colonies, as determined

by the sampling technique described. The corresponding figures for the small rotary plants were 49% and 6·4%; for the steam sterilization plants 50% and 23·5%, and for plants employing hand-washing only 0% and 83%. The type of plant, commonly used in London, in which the detergent is sprayed from jets, gave on the average better results than the soaker type. It is thought that the concentrations of caustic soda commonly recommended are unnecessarily high. A table is given of concentrations at different temperatures which will be found satisfactory provided (a) large particles of gross material are removed in the pre-rinse section; (b) the detergent solution is properly filtered to remove suspended matter; (c) the strength is maintained by frequent additions of the detergent; (d) the tanks are cleaned out every few days, and (e) allowance is made for the intermittent exposure of the bottles to the solution in spray machines. Bottles are easily re-contaminated, after emerging from the detergent section, by the use of re-circulated warm rinse water. The authors deprecate the chlorination of rinse water, believing that this tends to encourage uncleanliness by masking its effects. It is thought better to ensure that plants are designed and operated in a manner which precludes heavy bacterial contamination.

The principles which should govern the design and operation of plants are discussed in detail. To guard against infection of bottles by handling in the dairy, automatic filling and capping machinery is recommended. The wide-mouthed bottle, with press-in disc cap should not be allowed unless fitted with a hooded cap. Instead the authors recommend a narrow-necked bottle closed with an aluminium cap covering the rim, or a single-service paper board container.—H. V. H.

GALLARDO, P. (1941). El problema de la leche en la ciudad de Lima. **[The Milk Problem in Lima].**—*Cron. méd., Lima.* **58.** 323–326. **2977**

A plea for an improvement in the quantity, quality, and cleanliness of milk sold in Lima. Suggestions include the importation of 1,000 milch cows, and the establishment of a central pasteurizing plant.

See also absts. **2986, 2987** (milk pasteurization), **2798, 2799** (tubercle bacilli in milk), **2819–2821** (brucella in milk), **2905, 2906** (trichinosis).

TECHNIQUE AND APPARATUS

BODIN, S., & TOLL, H. (1940). Ein Serumabfüllapparat. **[A Serum Decanter].**—*Zbl. Bakt. I. (Orig.).* **146.** 93–96. **2978**

The apparatus consists of a serum reservoir feeding by gravity a duplicated pipette system linked to a master tap which discharges the one system and simultaneously fills the other. In order to enable several different doses of serum to be available for filling groups of vessels of varied size at one time, decanting pipettes of suitable size are employed which, by means of stopcocks, can be cut out individually. In the apparatus illustrated in the paper, a series of three pipettes of 10, 15, and 50 ml. are mounted in each half of the duplicated system, enabling many different doses of 10–75 ml. to be drawn off. The master tap is worked by a foot pedal leaving the hands free to deal with the vessels which are to be filled.—J. E.

HORSTMANN, H. (1941). Gefäss und Verschluss für die Tuberkelbakterienkultur. **[Bottles and Stoppers for Culture of Tubercle Bacilli].**—*Zbl. Bakt. I. (Orig.).* **146.** 382–389. **2979**

H. recommends the ordinary flat-sided medicine bottle of 50 ml. capacity fitted with a screw cap.—J. E.

KAPSENBERG, G. (1940). Eine "Kulturkappe" an Stelle des Wattepfropfens. **[A Metal "Culture Cap" for Use in Place of a Cottonwool Plug].**—*Zbl. Bakt. I. (Orig.).* **146.** 80–93. **2980**

K. describes a specially made metal cap for ordinary test tubes used for agar cultures. The cap is cylindrical and fits closely around the outside of the tube and is held firm by spring strips which grip the inside of the tube. A rod with a knob at the end is fixed to the top of the cap and serves as a handle. The cap is tight enough to be dust proof and to retain moisture in the tube, but is not absolutely air-tight.—J. E.

LA CAVA, F. W., & KETCHUM, M. E. (1943). **A Mass Method for Concentrating and Staining Tubercle Bacilli.**—*Amer. Rev. Tuberc.* **47.** 631–634. [Spanish summary]. **2981**

A method is described of concentrating tubercle bacilli in samples of sputum, pus, and pleural and gastric fluids. Material was mixed with a digestion mixture containing one part tergitol O8 and three parts 4% NaOH, shaken for 20 min., centrifuged, and smears made of the sediment. A modified staining technique is described which can be used at 40°C. and takes effect in 10 min.—R. S. DE ROPP.

STEINBERG, P., & MOLLOR, M. (1942). **A "Transparent Chocolate Agar" for the Primary Isolation of the Neisseria and Hemoglobinophiles.**—*J. Lab. clin. Med.* **27.** 656–659. **2982**

The preparation is described of a chocolate agar medium which is transparent, and which supports initial growth of meningococci, gonococci, and the influenza bacillus. It eliminates the need of several separate media for the cultivation of the *Neisseria* and the haemoglobinophiles.

YEGIAN, D., & BUDD, V. (1943). **Ziehl-Neelsen Technique. Staining Properties Modified by Different Preparations of Basic Fuchsin.**—*Amer. Rev. Tuberc.* **48.** 54–57. **2983**

Basic fuchsin, as used in the Ziehl-Neelsen method for staining tubercle bacilli, includes several salts with different staining properties which may cause confusion in the study and identification of the organism.

When saturated solutions of rosaniline or pararosaniline acetate were used, it was found that beading occurred in 50–100% of the organisms. The beaded forms are decreased in number when weaker solutions of this dye are used, but the organisms are only faintly stained. When saturated solutions of rosaniline or pararosaniline chloride are used, beaded forms are uncommon. Even in a concentration of 0·3%, these forms do not appear and the bacilli are solidly and evenly stained.

Rosaniline chloride in a concentration of 0·3% is recommended for routine use, and it is suggested that the term "basic fuchsin" be abandoned.—D. L. H.

*CHRISTOFFERSEN, P. A., & OTTOSEN, H. E. (1941). **Recent Staining Methods.**—*Skand. VetTidskr.* **81.** 599–607. [In English]. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **142.** 429]. **2984**

Hallberg's *Nachtblau* method for the detection of TB. did not give results superior to the Ziehl-Neelsen or fluorescence microscopy methods. The type of material used is not stated in the abstract. Köster's method for *Brucella abortus* [*V. B.* **7.** 321.] gave about 10% more positives than the usual method. A more concentrated safranin solution was used in this work.—J. G. CARR.

KATZNELSON, H. (1942). **A Staining Technique for Evaluating the Toxicity of an Antibiotic Substance of Microbiological Origin.**—*Canad. J. Res.* Sect. C. **20.** 602–608. **2985**

Due to the lack of a rapid method of determining the toxicity of antibiotic substances, work on a method of detecting dead yeast cells is described. To the toxic material are added the cell suspension and an equal quantity of a 1 : 5,000 solution of neutral red; this is incubated for three hours and counts are then made of the stained shrunken organisms. This method was used in several experiments. It is suggested that the technique can be applied in evaluation of fungicidal or bactericidal properties of disinfectants and chemotherapeutic agents.—W. E. SWALES.

GREAT BRITAIN. (1943). **Ministry of Health. The Phosphatase Test for Heat Treated Milk. Laboratory Technique.**—Addendum to *Memo. Minist. Hlth, Lond.* No. 139/Foods. pp. 4. **2986**

A detailed account is given of the technique to be used in carrying out the phosphatase test for the efficiency of commercial pasteurization. Tests should be carried out in duplicate, controls being used and precautions taken to avoid contamination by dirt, saliva, and phenol compounds.

Readings of 2·3 Lovibond blue units are classed as "sufficiently heat treated", readings of 2·4–2·6 as "insufficiently heat treated", and readings of over 6·0 units as "grossly undertreated".

An appendix gives the official Ministry of Health form for the reporting of results.—R. M. ARNOLD.

BALL, C. O. (1943). **Short-time Pasteurization of Milk.**—*Industr. Engng Chem., Industr. Edition.* **35.** 71–84. **2987**

B. draws attention to the growing use of the short-time method of pasteurization (161°F. for 16 sec.), bringing with it the necessity of increased stress on accurate time and temperature control. Difficulties in establishing such controls on a reliable basis have been some of the drawbacks to the method. On occasion, the counts of thermoduric bacteria have been high in milk pasteurized in this manner.

To explain some of these difficulties and to present a scientific approach to the problem, B. discusses some of the principles employed in the heat sterilization of canned foods and their application to milk pasteurization.—D. L. HUGHES.

*SCHIFFNER, G. (1940). Agglomeratbildung der Erythrocyten als diagnostisches Hilfsmittel bei chirurgisch kranken Pferden. [**Erythrocyte Agglomeration as a Diagnostic Aid in Surgical Diseases of Horses**].—*Inaug. Diss., Leipzig.* pp. 40. [Abst. from abst. in *Jber. Vet.-Med.* **68.** 32]. **2988**

For the differentiation between healthy and diseased horses the erythrocyte rouleaux formation test proved superior to the determination of the sedimentation rate. The former test is simpler and more rapid, its only disadvantage being the absence of any quantitative graduations in the results obtained.

The erythrocytes of horses with strangles showed some tendency to form rouleaux as early as two days before the appearance of symptoms.—M. LANDAU.

I. MACINNES, D. A. (1942). **Introduction to the Symposium [on Physico-Chemical Methods in Protein Chemistry].**—*Chem. Rev.* **30.** 321–322. **2989**

II. LONGSWORTH, L. G. (1942). **Recent Advances in the Study of Proteins by Electrophoresis.**—*Ibid.* 323–340. **2990**

III. PICKELS, E. G. (1942). **The Ultracentrifuge. Practical Aspects of the Ultracentrifugal Analysis of Proteins.**—*Ibid.* 341–355. **2991**

IV. NEURATH, H. (1942). **The Investigation of Proteins by Diffusion Measurements.**—*Ibid.* 357–394. **2992**

V. CANNAN, R. K. (1942). **The Acid-Base Titration of Proteins.**—*Ibid.* 395–412. **2993**

VI. HERRIOTT, R. M. (1942). **Solubility Methods in the Study of Proteins.**—*Ibid.* 413–421. **2994**

VII. MOORE, S., STEIN, W. H., & BERGMANN, M. (1942). **Protein Constituent Analysis by the Solubility Method.**—*Ibid.* 423–432. **2995**

VIII. ONCLEY, J. L. (1942). **The Investigation of Proteins by Dielectric Measurements.**—*Ibid.* 433–450. **2996**

I. This brief introduction to the American Chemical Society's symposium on the newer physico-chemical methods of protein investigation, stresses the advances which have resulted from the use of such methods, and indicates their importance in the preparation and study of pure proteins for chemical and physiological research. [These methods are also playing an ever more important part in the advancement of immunochemical knowledge.]

II. Recent advances in the experimental procedure for the electrophoretic analysis of proteins by the moving-boundary method are discussed, including a description of the new Tiselius electrophoresis cell and the cylindrical-lens method for recording the electrophoretic pattern. Applications of the methods in relation to naturally occurring protein mixtures are described, a critical examination of current procedures for computing protein concentrations is made, and relations which can be utilized for checking the consistency of the analyses are derived. Some hitherto unpublished details of manipulation and procedure are also given.

III. The theoretical and technical aspects of the principal points of the ultracentrifugal method are reviewed. The Svedberg equations for determining molecular weights by ultracentrifugal analysis are shown to be valid only if the proper significance is attached to the principles involved in the methods, the effects of hydration being particularly stressed. Sections are devoted to descriptions of the apparatus, optical methods, and experimental considerations involved, and the use of the relatively inexpensive cylindrical-lens method for the measurement of migrating boundaries is described.

IV. N. demonstrates the usefulness of diffusion measurements for protein studies and discusses the theoretical and practical limitations of four different methods of investigation. The theory of the methods, apparatus, measurements, and required calculations are described. The information derived from such studies is as follows:—(a) a direct estimate of the size of the protein molecules may be made, if the molecules are known to be spherical: if non-spherical, a second parameter, *e.g.* sedimentation rate, is required; (b) indications regarding changes in molecular shape or size resulting from physical or chemical reactions may be calculated from changes in diffusion rate; (c) information regarding the homogeneity of the test solution may be derived from diffusion data.

V. Problems relating to the determination and interpretation of the acid-base titration curves of soluble proteins are reviewed. The nature of the reaction of protein with acid and base is considered, and methods for identifying the number and nature of the ionizing groups are discussed. The shapes of the curves and the effect of electrolytes on them are described in terms of an electrostatic theory first developed by Linderstrøm-Lang.

VI. The application of Gibbs' phase rule to solubility curves as a means of obtaining information regarding the purity of a protein preparation is dis-

cussed. The cases cited are, that in which solubility does not vary with the amount of solid, and that in which it does. In general, the former case indicates the presence of a single pure component while the latter presents the possibility of either a mixture or a solid solution of two or more components. The use of solubility curves in the preparation of pure proteins is discussed and illustrated by a detailed description of the purification of pepsin and diphtheria antitoxin.

VII. The solubility-product method is discussed as a means of approach to quantitative knowledge of protein composition, and its principles and application to the determination of amino acids in protein hydrolysates are described. The properties and usefulness of aromatic sulphonic acids as agents in solubility analysis and in the quantitative fractionation of amino-acid mixtures is also indicated.

VIII. Procedures adapted to the investigation of proteins by measurement of the dielectric constant and conductance of solutions are described, and the effect of electrode polarization upon the results obtained is discussed. The interpretation of the results in relation to dipole moments and the size and shape (and hence the hydration) of the molecules is explained. A considerable number of the dielectric studies on protein solutions reported in the literature are given in tabular form.—J. LOCHIEL MCGIRR.

HANSON, L. E. (1943). **Ear Markings of Pigs. A Workable System.**—*Vet. Med.* **38.** 226–228. **2997**

H. describes, with diagrams, a system of numbering pigs by punching notches in the ears. Basic notches must be accurately spaced around the ears and numbers up to 999 can be built up from various combinations. Modifications are described for identification of, and within, litters and for prick-eared breeds. Damage to the ears by frost or by bites of other pigs may lead to loss of identity marks.—R. M. ARNOLD.

See also absts. **2803** (diagnosis of TB.), **2838** (of trichomoniasis), **2842** (culture of plasmodia), **2857** (isolation of E.E. virus), **2889** (electron microscopy of rickettsia), **2834** (of bacteria), **2806**, **2807**, **2814** (electrophoresis of serum), **2903** (helminth control), **2907** (differentiation of sheep nematode eggs), **2976** (sterilization of milk bottles).

MISCELLANEOUS

WARE, F. (1943). **A Plea for a Broader System of Veterinary Education, with Special Reference to Indian Conditions.**—*Vet. J.* **99.** 158–161. **2998**

There are 2,471 veterinary graduates in the employ of civil governments in India today, but this number is quite inadequate for the veterinary work required to maintain the health of the many millions of animals in the country. The productivity of the livestock of the country must be improved and to this end W. suggests that there should be appointed in each province a special livestock department in which all aspects of the subject would be co-ordinated and which would have available to it expert veterinary opinion. He discusses veterinary education, stating that animal physiology should be given greater attention in the curriculum in order that the type of knowledge so gained might serve as a useful introduction to the study of pathology and other subjects.—H. V. HUGHES.

CHAVARRIA, M. (1943). **Veterinary Education in Mexico. Growth of National School of Veterinary Medicine.**—*Vet. Student, Iowa.* **5.** 118–119 & 146. **2999**

The Mexican National School of Veterinary Medicine was established in 1853. At that time it was attached to the School of Agriculture, but in 1916 it was separated. In 1929 the Veterinary School was incorporated within the National University.

After leaving the secondary school, the intending veterinary student spends two years at a preliminary science school. He then takes the five years' professional course. In addition to the usual professional subjects, this course includes rural economy, equitation, and legislation.

The number of students in the school has varied during the last ten years between 100 and 150, but there are only about 220 veterinary surgeons in the country. Some of these are employed by the Government in the Public Health Department, the Department of Agriculture, or the Army. Others practise among the stock farms. Very few have their own hospitals. —H. V. HUGHES.

HOPKIRK, C. S. M. (1942). **Veterinary Services in New Zealand. Their Present Organisation and Suggestions for Post-War Reconstruction.** pp. 7. Wellington. [4to]. **3000**

A presidential address to the New Zealand Veterinary Association, dealing with the post-war reorganization of the veterinary profession in New Zealand. The need for a national service in the country (not necessarily a State service) was urged, and to staff that scheme, the need for a veterinary school.

The suggestion was made that a national service might be organized within the framework of the Department of Agriculture by setting up a veterinary division with six subdivisions to administer Acts and Regulations, meat inspection, dairy factory practice, other rural practice, research work on disease and nutrition, and an extension service. It was suggested that a fully equipped veterinary school be placed at Wallaceville alongside the research and diagnostic laboratories. Students should be given free education by a bursary system. The school should have a bias towards preventive rather than curative medicine.—M. B. BUDDLE.

UHLENHAUT, F. (1940–41). Servicio Veterinario Nacional. **[The National Veterinary Service of Peru].** —*Bol. Direcc. agric. Ganad., Lima.* 11/12. 218–240. **3001**

A description by U., head of the National Veterinary Service, of the Government veterinary services in Peru, which are organized as nine regional services under the supervision of veterinary surgeons or persons with degrees in agriculture. It was found necessary to employ the latter, as sufficient veterinary surgeons were not available; there is no veterinary college in the country. Further, because of the lack of veterinarians, it has been found necessary to train laymen to carry out large-scale inoculations and similar work.

This report gives an account of work done by the State service, including control of epizootics, meat inspection, and milk control. Considering the serious lack of veterinary surgeons, the service appears to have undertaken a great deal.

U. outlines a programme for the future, stressing the need for the training of more lay helpers, the improvement of quarantine facilities, and the establishment of an artificial insemination centre.—M. WATSON.

MEYER, D. B., & MARSH, M. (1943). **Development and Management of a Cotton Rat Colony.**—*Amer. J. publ. Hlth.* **33.** 697–700. **3002**

Following the demonstration by ARMSTRONG that poliomyelitis virus could be transmitted to cotton rats (*Sigmodon hispidus hispidus*), the authors have developed

and maintained a colony of these rats in captivity. The most suitable diet was found to be one part of sunflower seed, three parts of rolled oats, equal parts of particular commercial fox and mouse foods, and fresh apples, carrots, tomatoes, or alfalfa cuttings. Water should be available from drop bottles.

Sexes were paired at 6–7 weeks of age. The oestrous cycle was 4–8 days, and gestation varied from 26–28 days. The young were eating solid food within a week of birth and they were weaned at three weeks of age. The animals are vicious and they have to be handled with stout cow-hide gloves. The principal cause of death was fighting.—D. L. HUGHES.

DUSSEL, A. G. (1938). Influencia del clorhidrato de morfina sobre la coagulabilidad sanguinea y leucocitometria en el perro. [**Influence of Morphine on Blood Coagulability and Leucocytes in the Dog**].—*An. Fac. Med. vet., Univ. La Plata.* **1.** 171–197. **3003**

The claim of PUGLIESE that morphine prevents coagulation of the blood, and causes lysis of the leucocytes, could not be confirmed. A slight retardation in the time of coagulation of the blood was observed. Most animals showed some degree of neutrophilia, with severe physical and mental depression after repeated doses.—J. G. CARR.

FOX, L. A. (1943). **Bacterial Warfare. The Use of Biologic Agents in Warfare.**—*J. Lab. clin. Med.* **28.** 539–553. **3004**

A well reasoned article emphasizing the narrow limitations of bacterial warfare. The great influence which epidemic diseases of man and animals have had on military campaigns is, however, recognized, since it is not until the 20th century that we find a campaign "where the missiles of the enemy produce more casualties than epidemic disease".

The article is also of general epidemiological interest. The intestinal diseases are dismissed as being readily controlled by sanitary measures, but it is admitted that there are still no known means of controlling influenza, pneumonia, and the common cold. F. points out, however, that the organisms causing these diseases are always present, but that the production of an epidemic depends on complex factors which could not be produced at will by combatant forces.

Bacillus anthracis is the organism which most nearly fulfils the requirements of a "military pathogen": it is highly virulent, resistant to destruction, can be produced in large quantities, and infects both man and animals. Epidemic anthrax is, however, unknown in man and there is an effective vaccine. It is also probable that available prophylactic and curative measures against the gas gangrene and tetanus organisms would render ineffective any attempts to use them for military purposes.

Such statements as "An airplane can carry sufficient toxins to destroy an entire city" are obviously misleading. "The hostile aviator will not find the entire population lined up to accept the carefully measured lethal dose of botulinus toxin."

After a brief discussion on animal and plant diseases, it is concluded that practically insurmountable technical difficulties prevent the use of biological agents as effective weapons of warfare.—JOHN FRANCIS.

*REINHARDT, V. (1940). Beitrag zur Kenntnis der Häuteschäden. Ist eine Zu- oder Abnahme in den letzten 10 Jahren zu verzeichnen und worauf ist diese Entwicklung zurückzuführen? (Unter besonderer Berücksichtigung süddeutscher Verhältnisse). [**Damage to Hides. Has it Increased or Decreased during the Last Ten Years?**]—*Inaug. Diss., Giessen.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 454]. **3005**

About a quarter of all hides are damaged, and the loss from warbles is RM 5–7 million annually. The introduction of a so-called *Eintagsbetrieb* [one-day procedure] at abattoirs has led to an increase in damage to hides [? through lack of time for careful flaying].

DOVE, W. F. (1935). **A Study of the Relation of Man and Animals to the Environment.** [I].—*Rep. Me agric. Exp. Sta., 19[34]–35.* Reprint pp. 18. **3006**

DOVE, W. F. (1937). **A Study of the Relation of Man and Animals to the Environment.** [II].—*Ibid. 1936–37.* pp. 197–201. **3007**

DOVE, W. F. (1938). **A Study of the Relation of Man and Animals to the Environment III.**—*Ibid. 19[37–]38.* Reprint pp. 4. **3008**

DOVE, W. F. (1939). **The Relation of Man and of Animals to the Environment IV.**—*Ibid. 19[38–]39.* pp. 726–773. **3009**

DOVE, W. F. (1940). **A Study of the Relation of Man and of Animals to the Environment V.**—*Ibid. 19[39–]40.* pp. 235–248. **3010**

DOVE, W. F. (1941). **A Study of the Relation of Man and of Animals to the Environment VI.**—*Ibid. 19[40–]41.* p. 441–458. **3011**

I–VI. Since 1926, the whole programme of the Department of Animal Biology, Maine Agricultural Experiment Station, has been devoted to this study. Much of the work has been published in scientific journals, and the present series of papers is intended to present a semi-popular review of the programme as a whole.

The animal, as the indicator both of plant and soil qualities and, to some extent, of human needs within the same environment, was chosen as the key point of what is termed the "climate-soil-plant-animal-man" network. The studies have been partly of an experimental nature, but have in the main consisted of survey work. The topics mentioned in these reports include:—surveys of nutritional diseases in dairy cattle, poultry, and man; embryonic mortality in poultry; experimental work on food-selection habits in poultry; dental disease; the selection of genetic strains of fruits and vegetables for high mineral and vitamin contents; the geographical relation between production of inferior foodstuffs and the incidence of malnutrition; relevant aspects of soil science; and the "politico-economic" and "psychosocial" implications of the studies as a whole.—ALASTAIR N. WORDEN.

REPORTS

CANADA, NOVA SCOTIA. (1943). **Report of the Department of Agriculture for the Year Ended November 30, 1942.** pp. 195. Items of veterinary interest pp. 146–149. Halifax: King's Printer. [8vo]. **3012**

ANIMAL PATHOLOGY DIVISION [HANCOCK, E. E. I.]—Treatment of sheep with phenothiazine proved effective for the control of OESOPHAGOSTOMIASIS. SWINE FEVER was well under control. ANAEMIA of unweaned pigs due to deficiency of iron occurs in housed animals. Digestive disturbances at, or following weaning, were a frequent cause of unthriftiness and of death. There are three artificial breeding units operating under the supervision of the Division.

A laboratory is operating under the direction of the Division at the Nova Scotia Agricultural College at Truro. Of 357 specimens received for diagnosis, 333 were from poultry. These show that poultry losses are mainly due to improper brooding, PULLORUM DISEASE, COCCIDIOSIS, INTESTINAL PARASITISM, LEUCOSIS, and "BLUE-COMB" or "PULLET DISEASE". 52,958 poultry

blood samples were tested for PULLORUM DISEASE and 856 bovine blood samples for CONTAGIOUS ABORTION. In tuberculin retests of 142,726 cattle, there were less than 0·5% reactors.—J. A. GRIFFITHS.

CANADA, BRITISH COLUMBIA. (1942). **Thirty-Seventh Annual Report of the Department of Agriculture for the Year 1942.** pp. X 144. Items of veterinary interest pp. X 56–X 57, X 62–X 66, X 69–X 74, X 83–X 84. Victoria, B.C.: Printer to the King's Most Excellent Majesty. **3013**

REPORT OF THE CHIEF VETERINARY INSPECTOR [KNIGHT, A.]—Losses from BLACKLEG occurred in three Districts. Ranchers are advised to use an aggressin on all young animals each year. A number of outbreaks of HAEMORRHAGIC SEPTICAEMIA occurred. Owners are advised to vaccinate susceptible animals. Among 7,147 cattle tested for TUBERCULOSIS, there were 27 reactors, which were slaughtered. All dairy livestock and dairy premises are inspected.

JOHNE'S DISEASE has been detected on four farms in the past few years.

There was little evidence of BOVINE CONTAGIOUS ABORTION in the Lower Fraser Valley and Vancouver Island. Isolated cases of ACTINOMYCOSIS were observed in Central B.C. and Cariboo Districts. The disease is not as prevalent as in previous years. No outbreak of COCCIDIOSIS in farm animals was reported. An outbreak of EQUINE ENCEPHALOMYELITIS occurred in which there were nine deaths. Vaccination in the area infected had been neglected. STERILITY among cattle due to VAGINITIS occurred in four small herds near Quesnel. Other conditions which occurred are ANAEMIA in pigs, FOOT ROT in sheep, a condition known as "BIG-FOOT" in sheep, and MALNUTRITION in pigs and sheep.

REPORT OF THE LIVESTOCK BRANCH [GUNN, W. R.]—The following are mentioned :– HAEMORRHAGIC SEPTICAEMIA, JOHNE'S DISEASE, CONTAGIOUS ABORTION (calfhood vaccination), CASEOUS LYMPHADENITIS, EQUINE ENCEPHALOMYELITIS, CALCULI in range steers (due to malnutrition), WARBLE FLY and TICKS (control by the use of derris washes).

REPORT OF POULTRY BRANCH (DISEASES) [BRUCE, E. A.]—Many cases of PARALYSIS were found to be due to deficiency of green feed. Dosing with sulphur appears to be beneficial. Other diseases mentioned are LEUCAEMIA, CROUP, COCCIDIOSIS, and ENTERO-HEPATITIS in turkeys.

REPORT OF THE PROVINCIAL PLANT PATHOLOGIST [EASTHAM, J. W.]—Specimens of plants received from GUNN proved to be the "arrow grass" (*Triglochin maritima* L.) a well known cause of hydrocyanic acid POISONING in arid or semi-arid regions. In this case serious trouble occurred in cattle, on a range near Clinton. E. considers that the species of timber milk vetch causing losses in British Columbia is *Astragalus serotinus* and doubts whether *A. campestris*, as described by HENRY, occurs there. BRUCE found that the plant had caused many cases of illness when eaten by horses, cattle, or sheep. When fed experimentally to sheep, it caused death.—J. A. GRIFFITHS.

I. NEW ZEALAND. (1942). **Annual Report of the Livestock Division** [BARRY, W. C.]—*Rep. Dep. Agric., N.Z., 1941–42.* pp. 2–4. **3014**

II. *NEW ZEALAND. (1943). **Annual Report of the Live-Stock Division.** [BARRY, W. C.]—*Rep. Dep. Agric., N.Z., 1942–43.* pp. 3–5. **3015**

I. Although the season was not particularly favourable from the production point of view, losses of stock from diseases or parasitic infestations were not very serious.

The number of cattle condemned under the scheduled diseases of the Stock Act, *viz*, TUBERCULOSIS, ANTHRAX, BLACKLEG, JOHNE'S DISEASE, ACTINOMYCOSIS, and MALIGNANT NEOPLASMS, is listed. "GRASS STAGGERS" was responsible for some fairly heavy losses in cows, including beef breeds.

PREGNANCY TOXAEMIA in ewes was responsible for considerable loss in the South Island, being related to severe weather conditions. ENZOOTIC ICTERUS in several districts in the North Island was the only other disease causing serious mortality in sheep.

In pigs, *Salmonella cholerae-suis* infection continues to be a troublesome disease. An amendment to the Stock Regulations was introduced during the year with the view to controlling the further possible introduction from Australia of pigs infested with *Stephanurus dentatus*.

Figures are given indicating the Dominion's stock imports and exports and the numbers slaughtered at meat-export abattoirs.

II. No serious diseases in horses, cattle, or sheep were reported during the year.

The numbers of cattle condemned and compensated for under the scheduled diseases of the Stock Act are listed.

The incidence of "GRASS STAGGERS" and "MILK FEVER" in dairy cows was lower than in previous years. PARASITISM in young cattle was responsible for considerable loss.

A heavy mortality in pigs fed on mangolds was investigated and some interesting information was obtained on the use of mangolds for pig feeding.

—M. B. BUDDLE.

I. NEW ZEALAND. (1942). **Annual Report of the Animal Research Division.** [FILMER, J. F.]—*Rep. Dep. Agric., N.Z., 1941–42.* pp. 4–6. **3016**

II. *NEW ZEALAND. (1943). **Annual Report of the Animal Research Division.** [FILMER, J. F.]—*Rep. Dep. Agric., N.Z., 1942–43.* pp. 5–6. **3017**

I. Investigations on immunization of cattle against BRUCELLOSIS were continued and about 400 heifer calves were vaccinated.

In the MASTITIS investigations the milking machine and segregation experiments were continued. Milking machine work was actively continued and methods of effecting economy in the use of rubber in milking machines were considered. Investigations conducted on the practice of non-stripping in dairy herds indicated that where the milking machine is kept in good condition and reasonable care is exercised, there is no significant decline in production or increase in mastitis.

A fairly widespread FACIAL ECZEMA outbreak of short duration occurred in the Gisborne district during the year. In connexion with this disease, liver pathology was investigated and grazing trials were conducted. Work on alkaloids in rye-grass was continued with a view to determining their significance in plant physiology and their possible effect on the health of grazing animals.

An experiment was commenced on a property where TOXAEMIC JAUNDICE causes serious mortality among sheep, and regular observations are being made to determine the factors concerned in the development of the disease.

The semen-testing service for bull FERTILITY was continued. Work on artificial insemination of cows indicated that the use of proven sires can now be widely extended in New Zealand as soon as suitable organization is provided.

Parasitological and nutritional investigations have also been actively continued.

II. Free vaccination of calves with strain 19 vaccine against BRUCELLOSIS was made available. Approximately 20,000 calves in 1,150 badly infected herds were immunized.

In collaboration with the Dairy Board, a three years' project was initiated with a view to determining any correlation which may exist between the incidence of MASTITIS and such environmental factors as climate, diet, shed hygiene, and milking machines.

The Diagnostic Section at Wallaceville examined 7,000 specimens during the year, as well as preparing large quantities of BLACKLEG and "SCABBY MOUTH" (CONTAGIOUS ECTHYMA) vaccines.

In the sheep unthriftiness investigations in Canterbury, INTERNAL PARASITES were more in evidence than during previous seasons and an opportunity was afforded to study the effects of medicinal treatment and various methods of feeding and management. Investigations into the relative susceptibility to internal parasites of various sheep breeds and crosses were continued, and a number of field trials on phenothiazine were carried out. Various aspects of the hydatid problem were investigated.

While FACIAL ECZEMA was widespread in some districts, a very small number of cases occurred on the experimental areas, thus limiting the material available for investigation. Biochemical assays and experimental tests confirmed the belief that phylloerythrin is the photosensitizing agent responsible for the skin lesions. The investigation of rye-grass alkaloids was continued. Breeding experiments on the inheritance of Southdown PHOTOSENSITIZATION were extended. Investigations into the nutrition of dairy cattle and pigs were actively continued. Investigations were commenced on areas where "PEAT SCOURS" in cattle and ATAXIA in lambs occur. Preliminary work has revealed a deficiency of copper in the pasture and experiments have been initiated to determine the best methods of correcting this deficiency.

Experiments concerning bone diseases of sheep, mangold poisoning in pigs, cobalt deficiency, and zinc poisoning were continued. Other experiments indicated that milk and flesh from cows fed ergot in toxic doses were free from alkaloids and no ill effects were produced when they were fed to rats or pigs.

The serum-testing service for bull STERILITY was again available. Work on artificial insemination of cows was continued in two experimental herds.

—M. B. BUDDLE.

NEW ZEALAND. (1941). **New Zealand Dairy Board. Seventeenth Annual Report and Statement of Accounts for Period of 12 Months ended 31st July, 1941.** pp. 69. Items of veterinary interest pp. 13–15, 31, & 48–66. Wellington: Wellington Publishing Co. [4to]. **3018**

There were nearly 1,800,000 cows in milk in the Dominion and 16·7% of these were included in the milk-quality testing scheme, the figure showing a 31% increase as compared with the figure for the previous year. There are approximately 60,000 dairy sires; and sire survey work was continued. The most common cause of "culling" in dairy herds was stated to be "low milk production," and MASTITIS was the main cause of wastage due to disease. In a survey of 221 herds, 4·5% of the cows aborted and a further 3·5% were not in calf. An analysis of the results of the first mating according to the length of time elapsing between calving and such first mating shows that the peak of fertility appears to be reached in the period 10–15 weeks after calving. An investigation is in progress to determine whether less udder trouble occurs if stripping is not carried out.

A review is included of veterinary research work, such as was of interest to the Dairy Board, carried out by the Animal Research Division [see *V. B.* **12.** 190].

—H. V. HUGHES.

I. CEYLON. (1941). **Administration Report of the Acting Director of Agriculture for 1940.** pp. D 18. Items of veterinary interest pp. D 9–D 11. Colombo: Govt. Press. [8vo] [30 cents]. **3019**

II. CEYLON. (1942). **Administration Report of the Acting Director of Agriculture for 1941.** pp. 15. Items of veterinary interest pp. 8–11. Colombo: Govt. Press. [8vo] [30 cents]. **3020**

I. *Diseases.*—Very few cases of ANTHRAX were reported. Vaccine was used for immunization on some estates where the disease caused losses annually. Thirty-seven deaths from BLACKLEG occurred in Uva and Central Provinces. There is little doubt that many more deaths occur than are reported. Forty-nine cases of HAEMORRHAGIC SEPTICAEMIA were reported from three provinces. Three cattle were found infected with TUBERCULOSIS. One dog with RABIES was also found to be infected with TB. of bovine origin. The animal had been imported from Great Britain. There were no outbreaks of RINDERPEST. The mortality in the 1,111 cases of FOOT AND MOUTH DISEASE reported was 3·42%. There has been a steady increase in the numbers of cases of RABIES since 1936. There were 287 positive findings among the 679 brains examined, as compared with 193 positive in 1939. The positive cases included one human being, two monkeys, four cats, two jackals, one calf, one goat, and one bandicoot. The Eastern Province alone remained free from the disease. 111,420 dogs were destroyed. NEWCASTLE DISEASE continued to cause losses.

Research.—The research staff consisted of one veterinary research officer, and one assistant veterinary surgeon. 856 specimens were examined. Laboratory accommodation is very inadequate.

Amoebae identical with *Entamoeba histolytica* were found in a dog which showed typical symptoms of amoebic DYSENTERY; the owner of the dog suffered from amoebic dysentery. *Treponema theileri* was detected for the first time in Ceylon in the blood of a heifer. Work on ARTIFICIAL INSEMINATION of cattle was continued. 5,460 doses of FOWL-POX vaccine were issued.

Quarantine and inspection of imported animals.—Details are given of animals imported. The municipal quarantine station dealt with 24,437 sheep and goats, among which 85 cases of ANTHRAX occurred. An outbreak of FOOT AND MOUTH DISEASE occurred in Kayts quarantine station.

Livestock population.—There were 1,125,104 cattle, 567,717 buffaloes, 59,969 sheep, and 269,812 goats. 134,065 cattle, 8,310 buffaloes, 8,421 sheep and 102,827 goats were slaughtered.

II. *Diseases.*—121 cases of ANTHRAX were reported, 87 of these occurring in one outbreak in Uva. Cattle, buffaloes, wild pigs, wild elephants, and even pariah dogs died of the disease. The outbreak in Uva occurred in a jungle area, towards the end of a prolonged dry spell. Carcasses were burned and movements of cattle and buffaloes stopped. The outbreak ceased wth the onset of the rains. The immunization of cattle on two estates where the disease was enzootic prevented further losses. Forty-three cases of BLACKLEG were reported from the Central and Uva Provinces. Ninety-six cases of HAEMORRHAGIC SEPTICAEMIA were reported. One case of TUBERCULOSIS was detected in a bovine animal in Kandy municipal abattoir; five reactors were detected among animals from the same shed as this case; the reactors were slaughtered and compensation paid. A few cases of PIROPLASMOSIS were reported. NEWCASTLE DISEASE continued to be the most serious obstacle to the development of the poultry industry. The island remained free from RINDERPEST. 1,481

cases of FOOT AND MOUTH DISEASE were reported. The position of RABIES continued to be unsatisfactory. Of 715 brains received in 1941, 318 were positive as compared with 287 in 1940. 103,362 dogs were destroyed. No outbreaks occurred of CAPRINE CONTAGIOUS PLEURO-PNEUMONIA.

Research.—A new laboratory building was occupied. 741 specimens were examined. 57·3% of artificially inseminated cows calved. "African star grass", which has a high content of hydrocyanic acid was fed to cattle and to goats in amounts of 60 and 11 lb. daily respectively, without ill effect. Goat PARALYSIS was investigated; the majority of goats infected were of imported breeds, *viz*, Jamnapari, Kamori, and Alandi. Transmission by inoculation or contact failed in goats, white mice and g. pigs. 8,160 doses of FOWL POX vaccine were issued.

Quarantine and inspection of imported animals.—1,095 cattle and buffaloes and 24,400 sheep and goats were imported; 82 imported horses were inspected.

Livestock population.—There were 1,168,371 cattle, 592,092 buffaloes, 62,828 sheep, and 314,162 goats. The increase in the past 20 years is cattle 16% and buffaloes 18%. Goats have increased 65% in the past ten years, while the numbers of sheep have not increased. 140,030 cattle and 109,457 goats were slaughtered. Small numbers of buffaloes and sheep were slaughtered.
—J. A. GRIFFITHS.

PALESTINE. (1941). **Annual Report of the Veterinary Service, Department of Agriculture and Fisheries, for the Year Ended March 31st, 1940.** [SIMMINS, G. B.] pp. 7. Jerusalem. [fcp] [Typescript]. **3021**

Diseases.—There were 197 deaths from ANTHRAX in 37 outbreaks. In-contacts were vaccinated. Two outbreaks of BLACKLEG were reported and one outbreak of HAEMORRHAGIC SEPTICAEMIA. Owing to lack of funds, no action could be taken to control TUBERCULOSIS. Control of BOVINE CONTAGIOUS ABORTION in the herds in 135 settlements was, on the whole, satisfactory. Only 20 positive and 57 doubtful reactions were obtained among 40,000 blood samples tested. There was a considerable increase in the incidence of GLANDERS; 52 cases were detected and the animals destroyed. Owners are compensated. There was an increase in the number of outbreaks of SALMONELLA INFECTION among chickens and ducklings, and outbreaks also occurred among rabbits; 667 rabbits were destroyed and the owners compensated. Seven cases of EQUINE EPIZOOTIC LYMPHANGITIS were reported. Tick-borne diseases caused losses among all herds except the "village livestock"; losses were most severe among dairy herds. There was an alarming increase in the number of outbreaks of RABIES. Losses from FOOT AND MOUTH DISEASE in dairy herds were more severe than in previous years. Several outbreaks of SWINE FEVER were confirmed in the Jerusalem District. An outbreak of FOWL PLAGUE in the Haifa sub-District was suppressed by the slaughter of the whole of the affected flock, comprising 765 birds. PARASITIC GASTRO-ENTERITIS of sheep and goats was responsible for heavy losses.

Veterinary Laboratory (BINNS, H. R.)—A pure culture of *Brucella abortus* was isolated from a shoulder abscess of a mule. ABORTION in sheep occurred in several settlements, but the cause was not discovered. Over 42,000 specimens were received for examination and 3,551 slides were examined for field diagnosis. Production of stock vaccines and sera was continued. Over 44,000 agglutination and other tests were carried out. 567 horses were tested for DOURINE and 1·23% were positive. The Government Stud Farm is under the control of the Department.—J. A. GRIFFITHS.

BOOK REVIEWS

OGDEN, C. K. [Director of the Orthological Institute]. (1942). **Basic for Science.** pp. ix + 314. 3 figs. London: Kegan Paul, Trench, Trubner & Co. Ltd. [8vo] [2s. 6d.] **3022**

The use of Basic English as a means of facilitating international intercourse is now considered by many to be an important subject. Scientists, no less than others, feel the need for the greatest possible international contact, and difficulties of language have hitherto been a great stumbling block in this direction. A considerable amount of literature has been published in Basic English which, to the casual reader, appears not to differ from ordinarily correctly written English, and properly constructed and carefully prepared articles in Basic English appear to be lucid and concise. Basic is intended as an instrument of international intercourse; it is not being introduced to replace the living language of the English-speaking peoples. A danger, nevertheless, which the reviewer feels cannot be overlooked is that the widespread adoption of Basic may seriously threaten the richness, fluidity, and vitality of Modern English.

The Orthological Institute, under the directorship of Mr. C. K. OGDEN is responsible for extending the use of Basic, and Mr. OGDEN has written this book on the use of the system for scientific purposes. It is written in "Basic", and serves as an example of what can be done with a vocabulary limited to 850 basic words, plus a limited number of special vocabularies required for special subjects.

The system is explained in six chapters describing its application to science and its general operation. The bulk of the book is devoted to examples of articles written in Basic, some being of a "popular" nature for the general reader, and others for experts in particular sciences.

A list is given of Basic Science words with their meanings.—W. A. P.

OGILVIE, R. F. [M.D., F.R.C.P. (Edin.), Lecturer in Pathology and Assistant in Forensic Medicine, University of Edinburgh]. (1943). **Pathological Histology.** pp. xii + 411. 235 figs. Edinburgh: E. & S. Livingstone. [2nd Edit.] [8vo] [32s. 6d.] **3023**

In the second edition of this book, the text has been revised and brought up to date, many of the original photomicrographs have been replaced by illustrations of improved quality and clarity, and 15 further pathological conditions have been described and illustrated. The reviewer still [see also *V.B.* **10.** 571.] thinks that restriction of magnifications to the six or so which are within the range of the ordinary student's microscope would be preferable to the large number which are used, but this is a very minor criticism of an excellent student's text-book. The form of the book, paper quality, and arrangement of the text are practically the same as in the first edition. The book can, with confidence, be recommended for veterinary students and will greatly assist them in understanding their histological preparations.—E. G. WHITE.

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Printed under the authority of His Majesty's Stationery Office by H. R. GRUBB, LTD., Croydon

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ERRATA.

Vol. **9.** p. 605. For "FREUND, J., & ANGERINE, D. M.", read "FREUND, J., & ANGEVINE, D. M."
Vol. **11.** p. 292. For "VELASQUEZ, J. G. (1938)", read "VELASQUEZ Q, J. (1938)".
Vol. **12.** p. 68. For "NUMHEIMER, T. D. . . .", read "NUNHEIMER, T. D. . . ."
Vol. **13.** pp. 70-71 (abst. 456), last sentence. For "kidney functions", read "kidney *dys*functions".
p. 86 (abst. 554), title. For "Tentativi . . . di *pokko*", read "Tentativi . . . di *pollo*".
p. 116 (abst. 772). U.S.A. (1942). **Report of the Secretary of Agriculture 1941.** For correct version of this abst., see *V. B.* **13.** 198.
p. 116 (abst. 774). U.S.A. (1941). **New York State Department of Health.** For "1,316 heads . . . not recorded", read "1,316 examinations were made of 941 specimens. Negri bodies were found in 190 specimens". [Supplementary information received from the Department.]
p. 117 (abst. 777). For "Increased activity, shown by increased *toxicity* and amplitude", read "Increased activity, shown by increased *tonicity* and amplitude".
p. 137 (abst. 925), last sentence. For "200-225 mg. per kg. body weight, as compared with 250-365 mg.", read "200-225 μg. per kg. body weight, as compared with 250-365 μg.".
p. 141 (abst. 953), 5th paragraph. For "*antibothsopic* serum", read "*antibothropic* serum".
p. 143 (abst. 962), last sentence. For "total daily doses of 7·5 mg., 5 mg., 2 mg., 2 mg., and 1 mg. respectively", read "total daily doses of 7·5 g., 5 g., 2 g., 2 g., and 1 g. respectively".
p. 176 (abst. 1166). For "ZAPL, P. A., ...", read "ZAHL, P. A., ..."
p. 180 (abst. 1192). For "GYRÖGY, P., ...", read "GYÖRGY, P., ..."
p. 186 (abst. 1242b). For "*Streptococcus aureus*", read "*Staphylococcus aureus*".
p. 189 (abst. 1264). For "**Sodium Sulfanilly Sulfanilate**", read "**Sodium Sulfanilyl Sulfanilate**".
p. 191 (abst. 1276). For "*M. domestica, M. stabulans*", read "*M. domestica, Muscina stabulans*".
p. 201 (abst. 1341). LOVELL, R. (1943). For correct version of this abst., see *V. B.* **13.** 312.
p. 306 (abst. 2030). For "*Entomoeba histolytica*", read "*Entamoeba histolytica*".
p. 313 (abst. 2076). For "GRIFFITHS, S. D. (1942).", read "GRIFFITTS, S. D. (1942).".
p. 321 (abst. 2124), 2nd paragraph. For "meningopneumonitis of mice psittacosis, and" read "meningopneumonitis of mice, psittacosis, and".
p. 340 (abst. 2266), line 14. For "aspects of the *fats* and theories", read "aspects of the *facts* and theories".
p. 365 (abst. 2444). For "*Amer. Fur Breed.* **15.** 16-19", read "*Amer. Fur Breed.* **15.** No. 9. 16-19".
p. 372 (abst. 2496). For "**Nicotic Poisoning . . .**", read "**Nicotine Poisoning . . .**".
p. 442 (abst. 2965). For "[For part III, see *V. B.* **13.** 416]", read "[For part II, see *V. B.* **13.** 406]."